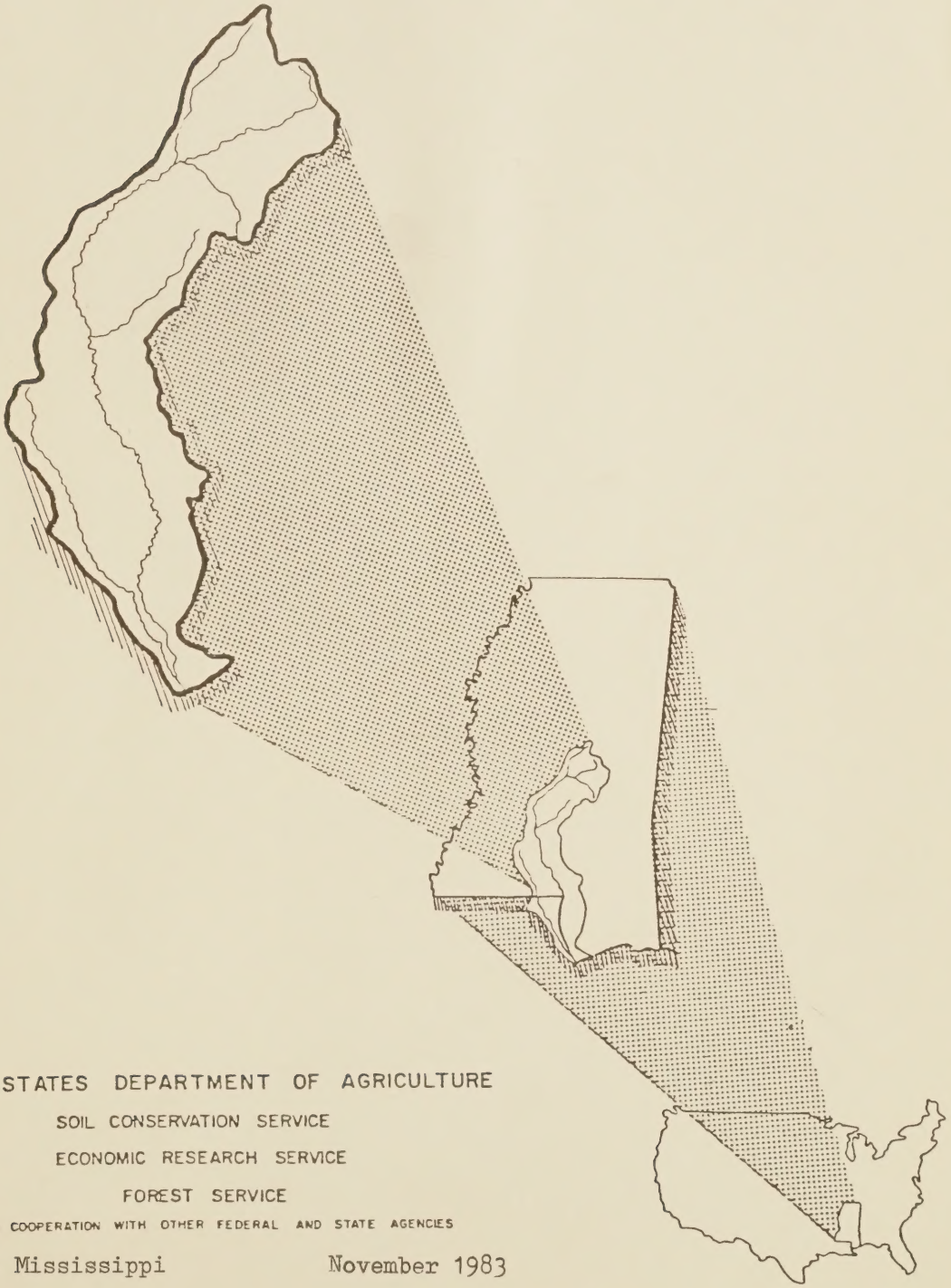
AGRICULTURAL RESOURCES OF THE PEARL RIVER BASIN (MISSISSIPPI PART)



UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

ECONOMIC RESEARCH SERVICE

FOREST SERVICE

IN COOPERATION WITH OTHER FEDERAL AND STATE AGENCIES

Jackson, Mississippi November 1983

AGRICULTURAL RESOURCES OF THE PEARL RIVER BASIN (Mississippi Portion)

Main Report

November 1983

UNITED STATES DEPARTMENT OF AGRICULTURE

In Cooperation With

DEPARTMENT OF ARMY
CORPS OF ENGINEERS
MOBILE DISTRICT
and
MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES
BUREAU OF LAND AND WATER RESOURCES
DIVISION OF WATER RESOURCES
and
PEARL RIVER BASIN DEVELOPMENT DISTRICT

Report Prepared By
USDA River Basin Survey Staff
Suite 1321, Federal Building
100 West Capitol Street
Jackson, Mississippi 39269

Under Direction Of
USDA Field Advisory Committee

B. C. Griffin, Soil Conservation Service, ending December 19, 1983
A. E. Sullivan, Soil Conservation Service, beginning January 9, 1983
Neil R. Cook, Economic Research Service
Bruce Baldwin, Forest Service

AGRICULTURAL RESOURCES OF THE PEARL RIVER BASIN (Mississippi Portion)

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AGRICULTURAL RESOURCES
of the
PEARL RIVER BASIN
(Mississippi Part)

CHAPTER I

SUMMARY

Purpose

The purpose of the United States Department of Agriculture's study of the Pearl River Basin was to prepare consistent and updated information relating to the land and water resources of the basin with special emphasis on the agricultural and forestry resources. Watersheds were evaluated to determine the effects on flood damage reduction within the watersheds. Recommendations for further study of individual watersheds are needed by the sponsors of the study and others interested in reducing flood damages. The sponsors, (1) Mississippi Department of Natural Resources through its Bureau of Land and Water Resources and (2) the Pearl River Basin Development District, in cooperation with other local, State, and Federal agencies have a need for such data in their continuing long-range program to determine the most beneficial combinations of uses of the land and water resources of the Pearl River Basin. Also, water storage sites were investigated to determine their potential to reduce flood damages along the principal streams.

The United States Department of Agriculture (USDA) agencies conducted its study of the Pearl River Basin in cooperation with the U. S. Corps of Engineers. The USDA Agricultural Resources Main Report will also be used as an appendix to the U. S. Corps of Engineers report for the Pearl River Basin.

The United States Department of Agriculture (USDA) agencies need additional information regarding opportunities for development of land and water resources throughout the basin. These data are the basis for assisting local organizations in the development of these resources under the provisions of the Watershed Protection and Flood Prevention Act and other USDA programs.

Authority

The United States Department of Agriculture participated in the Pearl River Basin Study under the authority of Section 6 of the Watershed Protection and Flood Prevention Act of the 83rd Congress (Public Law 566, as amended). This legislation authorizes the Secretary of Agriculture to cooperate with other local, State, and Federal agencies in investigating and surveying watersheds of rivers and other waterways for the purpose of developing coordinated programs.

Description of the Basin

The Pearl River Basin is located mainly in the state of Mississippi with a part of the lower basin being within Louisiana. The study area for the USDA report is the Mississippi part of the basin. This study area contains about 7,792 square miles of various land and water resources. Rainfall, temperature, and rich soils provide for healthy agricultural and forestry enterprises.

Four major land resource areas are within the Pearl River Basin and account for a variety of soils and land forms. Refer to Map 3.1. Land use varies, with forest being the major use. About 63 percent of the study area is forest with 30 percent being used for agriculture and the remainder being urban and built-up areas and other uses (7 percent).

The Pearl River is the major stream of the study area with the major tributaries being Yockanookany River, Tuscolameta Creek, Strong River, and Bogue Chitto. Perennial streams totaling 2,600 miles are found throughout the basin. The Ross Barnett Reservoir, located near the city of Jackson, is the largest body of water.

Economy

After several decades of declining population, many of the counties in the Pearl Basin experienced significant population growth during the 1970 decade. This growing population constitutes a growing market for goods and services and increasing demands for social services. Population growth in the 1970's was dispersed throughout the basin, with a significant part of the growth occurring in and near the Jackson metropolitan area. The economy of Jackson derives from its position as the center of State government; additionally, it serves as a regional distribution center and provides financial and business services statewide.

Much of the basin area is predominantly rural. The Upper Pearl River area is important for the production and processing of poultry products. The economy of the lower region is dominated by the production of lumber and wood products. Crop production, especially soybeans, is evident throughout the basin, with the major acreage located in the Upper Pearl River and Reservoir areas.

Needs

The investigations during this study identified problems and needs throughout the basin that relate to the land and water resources. Problems relating to the cropland, pasture, and forest resources of the basin are included. Emphasis was on the status of the resource management systems, flood damages, and erosion and sediment. The potential for reducing flood damages in upstream watersheds was also investigated. Data on a system of water storage dams as an alternative for flood damage reduction along the principal streams were collected and analyzed in cooperation with the U. S. Corps of Engineers.

Status of Land Treatment

The importance of adequate resource management systems on the acres used for crops and pasture is apparent when one compares such items as production costs, yields, and erosion in the context of the overall quality of the resource base. In most cases, production costs are lower, yields are higher, erosion rates are lower, and the overall quality of the soil resource base is improved where adequate resource management systems exist. The Pearl River Basin has a need for improved crop and pasture management systems. In many areas, the soil resource base is eroding at rates that cause deterioration.

Presently the Mississippi part of the Pearl River Basin has about 592.8 thousand acres of cropland and 903.1 thousand acres of pasture. It is estimated that 83 percent of the cropland and 61 percent of the pasture have a need for conservation measures in order to be adequately treated (see page 4-2 for definition). Opportunities exist throughout the basin to accelerate land treatment.

Projected future without project conditions for the year 2000 are for 599.4 thousand acres of cropland and 896.5 thousand acres of pasture. Much of these nearly 1.5 million acres to crops and pasture have a need for land treatment. Eighty-one percent of the total cropland or 487.5 thousand acres needs an adequate resource management system. Sixty-two percent of the total pasture or 554.9 thousand acres also has a need for conservation measures. The Upper Pearl River hydrologic unit has the most acres with treatment needs. See Map 2.1 and Table 2.1 for locations and names of the hydrologic units.

Cropland with critical erosion rates increases from 62.1 thousand acres for the present to 109.4 thousand acres for the future without project conditions, year 2000. Soil resources with critical erosion rates are expected to deteriorate. A different land use is needed on many of these acres to prevent deterioration of the soil base and to increase income.

Flooding

Flooding and flood damages are major problems throughout the basin. Twenty-five percent of the basin (1.3 million acres) is subject to flooding. About 70 percent of the flood plain is forest, 25 percent agricultural, with the remaining areas classed as either urban and built-up or other. Soybeans is the largest single crop of the flood plain. Total average annual flood damages amount to about $14.3 million for the present and are projected to increase to $17.4 million by the year 2000.

The potential for reducing flood damages with a structural project in upstream watersheds of the basin under the authority of PL 566 is not promising. The present planning criteria and costs of construction, plus environmental factors, all tend to make a favorable benefit-cost ratio impossible. The evaluations of small watershed projects are discussed in Chapter V and in the Appendix.

Erosion and Sediment

Total average annual gross erosion for the Pearl River Basin is projected to increase from 17.8 million tons for the present to 20.5 million tons for the future without project conditions, year 2000. Sheet erosion is the largest contributor; it accounts for 62 percent of the total gross erosion for the present conditions and for 65 percent for the projected conditions. Sheet erosion from cropland is estimated at 6.7 million tons for the present and 7.8 million tons for the projected conditions and makes up the largest single contribution. Streambanks are the next largest erosion hazard, with gullies, roadbanks, surface mines, and urban areas contributing lesser amounts.

Sediment yields vary for the Pearl River Basin, from 290 to more than 600 tons per square mile of drainage area for the present conditions. These sediment yields increase for the future without project conditions from 350 to more than 700 tons per square mile of drainage area. A need exists to reduce these sediment yields to prevent damages to downstream land and water resources.

Forest

Forest Acreage Loss - Between 1967 and 1977, the commercial forest land in the basin decreased about 60,000 acres.

Forest Production - The 1976 harvest of all timber was 117 percent above the 1966 harvest. Softwood sawtimber harvest in 1966 was 2.5 times that of hardwood. By 1977 this harvest ratio had increased to 3.5 times and by 1981 the harvest ratio had increased to almost 6 times that of hardwood. The 1976 softwood sawtimber harvest of 581 million board feet almost equaled the softwood sawtimber growth of 589 million board feet.

Regeneration Needs - More than a quarter million acres of commercial forest land have been harvested over a period of years and not reforested. Out of 3,025.0 thousand acres of forest land, 58 percent or 1,750 thousand acres offer viable opportunities for increased growth on private nonindustrial ownership.

CHAPTER II

INTRODUCTION

Objective and Scope

The objective of the study was to assimilate data and information concerning the agricultural resources of the Pearl River Basin. These data and information were needed to facilitate the orderly conservation, development, utilization, and management of the land and water resources of the basin. Conservation and development needs concerning agricultural resources for the study components were estimated and quantified for each component. These data provided information necessary for preparing a United States Department of Agriculture (USDA) report on the agricultural resources of the Pearl River Basin.

During the spring of 1979 a major flood occurred in the basin. Flood damages in the Jackson, Monticello, and Columbia, Mississippi areas, plus damages in smaller urban areas and to agricultural and rural areas, were in the hundreds of millions of dollars. As a result of this flooding, the United States Congress authorized the U. S. Army Corps of Engineers, Mobile District, to make a study to determine what could be done to prevent a recurrence of flooding throughout the basin. In addition, Congress directed the U. S. Department of Agriculture, Soil Conservation Service, to cooperate and participate in the study.

The scope of the USDA study was limited to the areas and study components that relate directly to the problems identified in the Plan of Work-Work Outline developed for the study by the USDA agencies--Soil Conservation Service, Economic Research Service, and Forest Service--and the State of Mississippi agencies--Department of Natural Resources and the Pearl River Basin Development District. These two state agencies sponsored and participated in the study. The United States Department of Agriculture study was limited to the Mississippi part of the Pearl River Basin and was based on the following considerations:

1. The study concerns as expressed by local interests in the Louisiana part of the basin are outside of the scope and responsibility of the USDA.

2. The State and local agencies that expressed interest in the USDA study are located in Mississippi.

3. The Mississippi part of the basin includes about 90 percent of the total basin area.

The study components were agricultural and forestry production and resources, land and water resources, flood damages, and erosion and sediment.

Secondary sources of data were used for most components, with the recently completed Phase I report of the Mississippi Statewide Cooperative River Basin Study being a main source. Topograhic maps supplemented by reconnaissance field data provided data for evaluating watersheds and water storage sites.

Present conditions were documented and quantified; future without project conditions were estimated for the year 2000 where data were available. Needs were tabulated for various parts of the basin.

Regions, Subregions, Hydrologic Units, and Areas

The Pearl River Basin is a part of the South Atlantic-Gulf Region of the United States. The region is divided into subregions, with the Pearl River Basin being one of the subregions. The subregions are also divided into cataloging units; for certain elements of the study, these units are further divided into hydrologic units. Table 2.1 is a listing of all of the codes, names, and drainage areas for the various hydrologic units used to present data in this report. These codes are from the Hydrologic Unit Map, 1976, State of Mississippi, prepared by the U. S. Geological Survey. These units are delineated on the location Map 2.1.

Data for the report are also presented by county and groups of counties or areas. Some data are for the entire counties while other data are for the county parts within the basin. Twenty-three counties are included. Noxubee County contained so few acres that it was not included in the groupings. The counties of the basin were separated into four areas as shown below:

Upper Pearl River Area		Reservoir Area
Attala	Neshoba	Hinds
Choctaw	Newton	Madison
Kemper	Scott	Rankin
Leake	Winston	

Middle Pearl River Area		Lower Pearl River Area	
Copiah	Lincoln	Hancock	Pearl River
Jefferson Davis	Simpson	Lamar	Pike
Lawrence	Smith	Marion	Walthall

Refer to Map 2.2 for the location of the various groups of county areas.

Watershed areas are used for some data. The watersheds are identified by cataloging unit code plus a three digit number code to identify the watershed.

Relationships to Other Studies

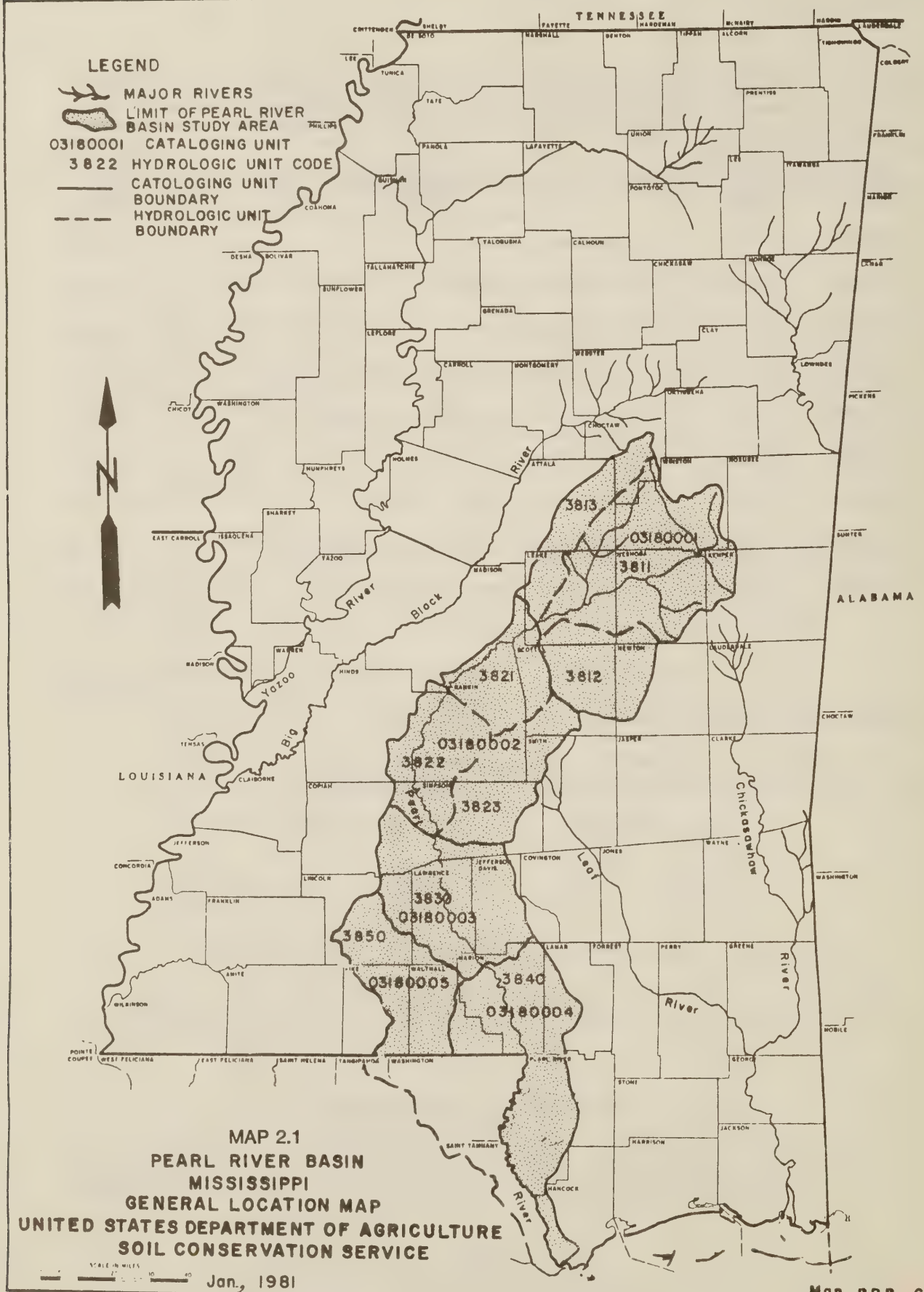
This study was special as the USDA, Soil Conservation Service, was directed by Congress to cooperate with the Corps of Engineers in their study of the Pearl River Basin. Previously, the U. S. Department of Agriculture

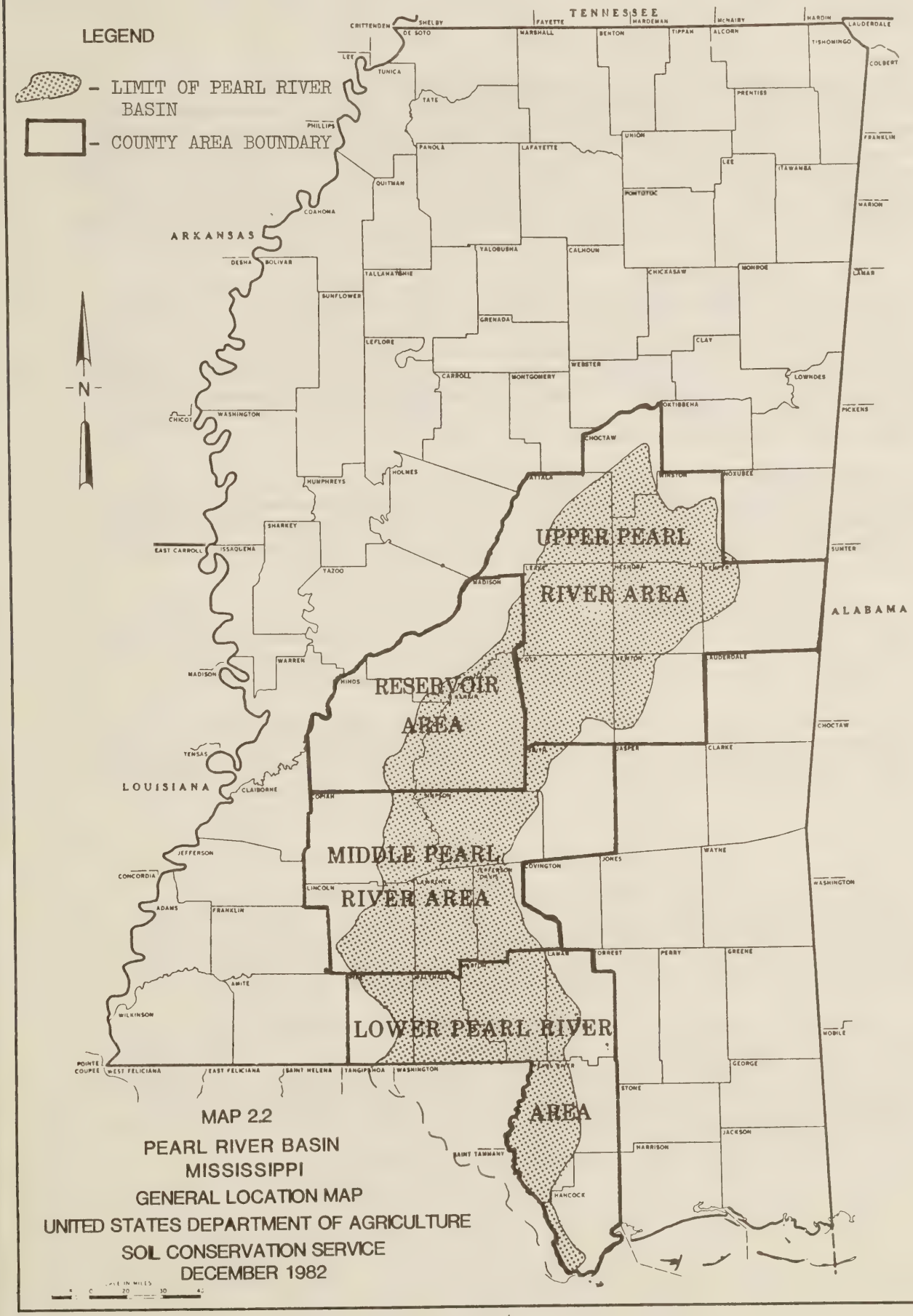
Table 2.1. Cataloging and hydrologic unit codes, names, and drainage areas, Subregion 0318, Pearl River Basin, Mississippi part, 1981

Cataloging unit 1/ Code	Hydrologic unit 2/ Code	Hydrologic unit Name	Drainage area Acres
03180001	3811	Upper Pearl River	902,050
03180001	3812	Tuscolameta Creek	368,765
03180001	3813	Yockanookany River	306,429
03180002	3821	Pearl River above Ross Barnett Dam	376,734
03180002	3822	Pearl River above Strong River	450,994
03180002	3823	Strong River	440,182
03180003	3830	Middle Pearl River	781,950
03180004	3840	Lower Pearl River (Mississippi part)	821,303
03180005	3850	Bogue Chitto (Mississippi part)	538,413
	0318	Basin Total	4,986,820

Source: Soil Conservation Service.

1/ Code from Mississippi Hydrologic Unit Map, 1974.
2/ Code as used for Mississippi Data Base (MARIS).


LEGEND
MAJOR RIVERS
LIMIT OF PEARL RIVER BASIN STUDY AREA
03180001 CATALOGING UNIT
3822 HYDROLOGIC UNIT CODE
CATOLOGING UNIT BOUNDARY
HYDROLOGIC UNIT BOUNDARY
TENNESSEE
ALABAMA
LOUISIANA
3813
03180001
3811
3821
3812
03180002
3822
3823
3830
03180003
3850
03180005
3840
03180004
Yazoo River
Big Black River
Pearl River
Leaf
Chickasawhay River
Pascagoula River
MAP 2.1
PEARL RIVER BASIN
MISSISSIPPI
GENERAL LOCATION MAP
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Jan., 1981
Map-P.R.B.-GL



MAP 2.2

PEARL RIVER BASIN
MISSISSIPPI
GENERAL LOCATION MAP
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DECEMBER 1982

participated with the Corps of Engineers in the Comprehensive Study of the Pearl River Basin, completed in 1970. This comprehensive study report consists of nine volumes, one of which concerns agriculture. The USDA also prepared a report entitled "Agricultural Requirements and Upstream Watershed Development, Pearl River Basin," dated September 1971. This report identified problems and needs and made recommendations for future planning to reduce problems related to agriculture. The results of this report were used in the present study, especially in identifying the watersheds for reevaluation.

The Mississippi Statewide Cooperative River Basin Study, presently in progress by the USDA, includes the entire area of Mississippi. Phase I of the study was completed in February 1982. Much of the data developed for the statewide study was used for this Pearl River Basin study. The Mississippi Data Base provided information on land use along with soil classifications. The statewide study also provided much information on the status of land treatment, erosion rates, gross erosion, sediment yields, and flood damages, especially agricultural and rural.

The Bureau of Land and Water Resources of the Mississippi Department of Natural Resources through its Division of Water Resources has responsibility for preparing a water plan for the State. Close cooperation with this State agency was maintained during the study to insure that study products complement data needed for the State Water Plan.

The information needs of the Pearl River Basin Development District are within the scope of the study. This District, a State agency, has responsibilities for development of the water resources of the basin. The District has authority to assist local districts in managing water resources.

Needs of the Pearl River Basin Study being conducted by the Corps of Engineers was a major consideration of the work performed by the U. S. Department of Agriculture agencies. Close coordination between the agencies prevented duplication of efforts and kept all informed of progress.

Use of Study

The results of the study will be used by the Mississippi Department of Natural Resources and the Pearl River Basin Development District as well as other local, State, and Federal agencies in setting priorities for future planning and for input data for a State Water Plan. Also, the data can be used by those interested in the resources of the entire basin.

The study results can be used by the USDA and the Mississippi Soil and Water Conservation Commission in identifying problem areas, such as critical erosion sources and areas with the most severe flood damages. Local Drainage Districts and Soil and Water Conservation Districts can use the report in preparing priorities for planning and in identifying problems and setting goals for their areas of concern.

The report must be in a form that will be meaningful to the user. The user or potential user must participate during the study if such a product is to result. Education and participation of the user and other publics are necessary for good study results.

This study report is to be provided as an agricultural appendix to the Pearl River Basin Study being conducted by the U. S. Army Corps of Engineers, Mobile District.

Participating Agencies and Organizations

The United States Department of Agriculture agencies--Soil Conservation Service, Economic Research Service, and Forest Service--had primary responsibility for preparation of this report. However, other agencies and organizations assisted in the preparation and review of data during the study. Their assistance made the report more complete and useful.

The sponsors, the Mississippi Department of Natural Resources, through its Bureau of Land and Water Resources, and the Pearl River Basin Development District, provided much help in the preparation of the study Plan of Work-Work Outline and in requesting assistance from others in carrying out the study.

A list of those that made a contribution to the study follows:

Corps of Engineers, Vicksburg District

Corps of Engineers, Mobile District

Fish and Wildlife Service

U. S. Geological Survey

Environmental Protection Agency

Mississippi Research and Development Center

Mississippi Bureau of Recreation and Parks

Mississippi Marine Resources Council

Mississippi Department of Natural Resources

- Division of Geologic Survey
- Bureau of Pollution Control
- Bureau of Land and Water Resources

Mississippi Crop and Livestock Reporting Service

Mississippi Forestry Commission

Mississippi State Department of Agriculture

Pearl River Basin Development District

Southwest Planning and Development District

Southern Mississippi Planning and Development District

Central Mississippi Planning and Development District

Mississippi Soil and Water Conservation Commission

Mississippi Farm Bureau Federation

Mississippi State University

- Department of Agricultural Economics
- Department of Wildlife and Fisheries
- Land Use Center
- Mississippi Extension Service

Report Format

Chapters III, IV, and V and Appendices A and B follow in the report. These chapters present the results of study.

Chapter III provides data on the agricultural resource base of the Pearl River Basin. The major land resource areas and soils of the basin are discussed and quantified. The overall land and water use is discussed. Cropland and pasture resources are quantified. The agricultural and forest economies are discussed. Generally, the resource base is quantified; the status of the resources is not a part of Chapter III.

Chapter IV includes data on the status of the agricultural resources of the basin for the present conditions. Cropland and pasture resource problems including the status of resource management systems are discussed. Flooding and flood damages are quantified. The kinds and amounts of erosion and sediment yields are quantified and discussed.

Chapter V provides similar data as presented in Chapter IV except for the future without project conditions, year 2000. Also, the potentials for flood damage reduction in upstream watersheds are discussed. An alternative structural measure for reducing flood damages along the principal streams is also discussed.

Appendix A discusses the evaluation of upstream watersheds. Appendix B provides design and cost data on a system of intermediate size structures for water storage.

CHAPTER III

AGRICULTURAL RESOURCE BASE

Location and Size

The Pearl River Basin is located within the states of Mississippi and Louisiana in the southern part of the United States. The Pearl River begins in east central Mississippi in the vicinity of Ackerman and Louisville, Mississippi and flows southwesterly into the Ross Barnett Reservoir near Jackson, Mississippi. The river then flows in a southerly direction through central Mississippi and southeast Louisiana into the Gulf of Mexico between Gulfport, Mississippi and New Orleans, Louisiana. The Pearl River is the State boundary between Louisiana and Mississippi in the lower reach. See the general location Map 2.1.

The Pearl River Basin contains all or parts of 24 counties in Mississippi and parts of three parishes in Louisiana. The basin drains an area of 8,760 square miles. The Mississippi part of the Pearl River Basin comprises about 7,792 square miles or about 89 percent of the total land and water area. The remaining 968 square miles or about 11 percent are located within Louisiana.

Climate

The climate of Pearl River Basin is a humid, subtropical one, influenced by the large land mass to the north and the Gulf of Mexico to the south. Modifications in the climate are due to the topography and proximity to the Gulf Coast. Near the Gulf of Mexico a stronger marine influence is exerted. In areas of the basin further north from the gulf, the climate generally is determined by the continental influence. Average annual temperature and precipitation are both slightly higher in the coastal portion of the basin. Also, the southern portion is affected by occasional tropical storms. Local thunderstorms, hurricanes, and frontal storms occur throughout the basin. Prevailing winds are from the south during spring and summer months. During the fall and winter months the winds are generally from the north and northwest.

Rainfall in the basin is abundant with an average annual amount varying from 62 inches along the Gulf Coast to 50 inches near the headwaters along the northern boundary. Rainfall is fairly well distributed throughout the year with the driest season being the fall. The northern portion of the basin has an average rainfall of about 52 inches with 31 percent occurring in the winter, 29 percent in the spring, 23 percent in the summer, and 17 percent in the fall. Total rainfall during the growing season is generally adequate although periods of drought and poor distribution during times of greatest need sometimes present moisture deficiencies. Annual precipitation extremes range from 29 inches to 93 inches.

The length of the growing season varies from about 225 days (from the last killing frost in March to the first killing frost in late October or early November) in the northern portion to 290 days or more near the Gulf Coast. The average annual temperature varies from 67 degrees Fahrenheit along

the coast to 64 degrees in the northern portion of the basin. Severe cold spells and freezing to sub-freezing temperatures occur although seldom lasting more than 3 to 4 days. Occasional snowfalls form only a negligible part of the annual precipitation.

Major Land Resource Areas and Soils

General

The Pearl River Basin is divided into four major land resource areas (MLRAs). Refer to Map 3.1 for the general delineation of the MLRAs. The four MLRAs are as follows: Southern Coastal Plain, MLRA 133A; Southern Mississippi Valley Silty Uplands, MLRA 134; Alabama, Mississippi, and Arkansas Blackland Prairies, MLRA 135; and Eastern Gulf Coast Flatwoods, MLRA 152A. A description of each MLRA is included below.

The soils of the basin are also described below. Tables are included that list the extent of the soils plus the major land uses. The soil data in this report are grouped by USDA-SCS land capability classification system. Any group or classification, therefore, contains all land capability units and soil mapping units in the designated classification. The land capability class primarily reflects a soil's suitability for cultivation as follows:

Capability classes with limitations for cultivated land
(few limitations for pasture)

- Class 1 - Few
- Class 2 - Some
- Class 3 - Severe
- Class 4 - Very severe

Capability classes generally not suited for cultivated land
(only permanent vegetation)

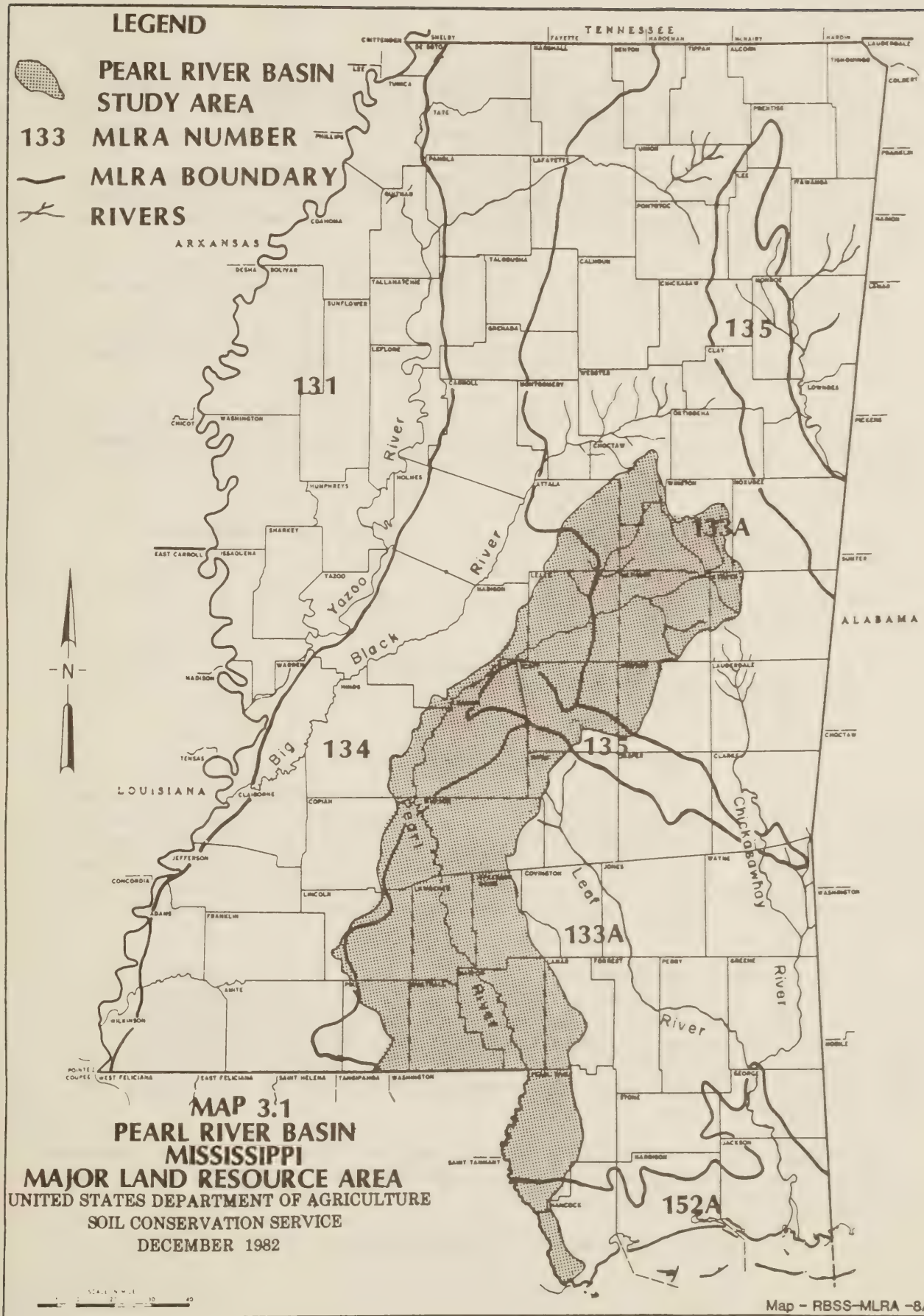
- Class 5 - Wet or subject to frequent flooding
- Class 6 - Steep slopes, severe erosion hazard
- Class 7 - Very steep slopes, very severe erosion hazard
- Class 8 - Tidal marsh, beach sand, high sulfur soils

The USDA-SCS land capability classification system is applied directly to cropland and indirectly to pasture and permanent vegetation. This system is not to be confused with woodland suitability group classifications, another system used only for forest land.

Land capability subclasses are groups of capability units within classes that have the same dominant limitations for agricultural use as follows:

Capability subclasses

- e - erosion hazard or past erosion damage
- w - wetness hazard and/or flooding hazard
- s - soil characteristics (e.g., shallow, stoniness, high sodium, etc.)



MAP 3.1
PEARL RIVER BASIN
MISSISSIPPI
MAJOR LAND RESOURCE AREA
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
DECEMBER 1982

Map - RBSS-MLRA -8/10/81

Areas without recognized soil classifications are included in the tables as "unclassified." These include areas such as borrow pits, berms, levees, urban land, and other areas that have been extensively altered by man and water.

The extent of the major land resource areas of the Pearl River Basin are tabulated in tables that follow. Also, data are presented in tables by land capability subclasses for various geographic areas. Major land uses are also shown in some tables.

Table 3.1 lists the land capability subclasses of the basin by acres and percents for each of the MLRAs.

Table 3.2 provides major land use data for the basin by MLRAs. Agricultural uses account for about 30.2 percent of the total.

Table 3.3 lists the soil resources by land capability subclasses for the Pearl River Basin by each county. The percent of the total area of each county within the basin is also shown (bottom line). Table 3.4 provides the same data but by hydrologic units.

Table 3.5 includes major land use acres for each land capability subclass found within the basin.

Table 3.6 lists the dominant soil series by MLRA for each land capability subclass of the basin.

A general discussion of the major land resource areas and soil resources of the Pearl River Basin follows.

Southern Coastal Plain, MLRA 133A

The Southern Coastal Plain (MLRA 133A) comprises about 3.4 million acres or 67.5 percent of the Mississippi part of the Pearl River Basin. The area is dissected into nearly level and gently undulating valleys and gently sloping to steep uplands. Topographic relief ranges to 200 feet or more. Narrow stream valleys in the upper reaches and wide valleys with meandering streams in the lower reaches are common. Unconsolidated sands, silts, and clays underlie the area.

Major land uses for MLRA 133A are forests (64.5 percent), agricultural (30.6 percent), with the remaining 4.9 percent included in urban and built-up and other categories. About 78.3 percent of the acreage of the MLRA has erosion hazards with 53.0 percent being in the very severe category (4e, 6e, and 7e). Water hazards (flooding and drainage) are the major concerns on 20.5 percent of the land. Shallow or high sodium content soils account for only 0.2 percent of the land area.

Principal upland soils of this MLRA include the Malbis, Ora, Ruston, Savannah, Smithdale, and Sweatman series. Principal bottomland soils are of the Bibb, Kirkville, and Mantachie series.

Refer to Tables 3.1, 3.2, and 3.6 for more details.

Table 3.1 Land capability subclass distribution by percents and acres by major land resource areas, Subregion 0318, Pearl River Basin, Mississippi part

Land capability subclass	Total	Major land resource area												Total
		Unclassified		133A		134		135		152A				
	Acres	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent			Percent
Unclassified 1/	53,007	53,007	100.0	0	0.0	0	0.0	0	0.0	0	0.0			100.0
1	24,094	0	0.0	24,094	100.0	0	0.0	0	0.0	0	0.0			100.0
2e	715,598	0	0.0	467,799	65.4	208,878	29.2	38,921	5.4	0	0.0			100.0
2s	9,143	0	0.0	9,143	100.0	0	0.0	0	0.0	0	0.0			100.0
2w	557,874	0	0.0	292,652	52.5	263,801	47.3	803	0.1	618	0.1			100.0
3e	864,179	0	0.0	378,650	43.8	435,178	50.4	50,351	5.8	0	0.0			100.0
3s	4,942	0	0.0	4,942	100.0	0	0.0	0	0.0	0	0.0			100.0
3w	175,023	0	0.0	119,545	68.3	6,610	3.8	48,868	27.9	0	0.0			100.0
4e	476,262	0	0.0	372,656	78.3	65,364	13.7	38,242	8.0	0	0.0			100.0
4s	2,719	0	0.0	0	0.0	2,719	100.0	0	0.0	0	0.0			100.0
4w	227,967	0	0.0	36,080	15.8	154,202	67.7	34,411	15.1	3,274	1.4			100.0
5w	432,337	0	0.0	233,282	54.0	199,055	46.0	0	0.0	0	0.0			100.0
6e	715,846	0	0.0	710,162	99.2	4,325	0.6	1,359	0.2	0	0.0			100.0
6s	1,111	0	0.0	1,111	100.0	0	0.0	0	0.0	0	0.0			100.0
7e	706,578	0	0.0	706,454	99.9	124	<0.1	0	0.0	0	0.0			100.0
7w	9,699	0	0.0	9,699	100.0	0	0.0	0	0.0	0	0.0			100.0
8w	10,441	0	0.0	0	0.0	0	0.0	0	0.0	10,441	0.0			100.0
Basin Total	4,986,820	53,007	1.0	3,366,269	67.5	1,340,256	26.9	212,955	4.3	14,333	0.3			100.0

Source: Mississippi Automated Resource Information System (MARIS).

1/ Includes all areas without a soil mapping unit. Generally, these areas were not assigned to a major land resource area.

Table 3.2. Major land use by major land resource areas and basin total, Subregion 0318, Pearl River Basin, Mississippi part, present, 1975

Major land resource area	Unit	Land Use				TOTAL
		Agricultural	Forest	Urban and built-up	Other	
Basin Totals						
MLRA 133A	Acres	1,028,699	2,171,876	127,143	38,551	3,366,269
	Percent	30.56	64.52	3.78	1.14	100.00
MLRA 134	Acres	411,826	806,971	98,786	22,673	1,340,256
	Percent	30.73	60.21	7.37	1.69	100.00
MLRA 135	Acres	60,297	137,584	12,541	2,533	212,955
	Percent	28.31	64.61	5.89	1.19	100.00
MLRA 152A	Acres	371	4,139	124	9,699	14,333
	Percent	2.59	28.88	0.86	67.67	100.00
Unclassified 1/	Acres	3,026	9,139	2,968	37,874	53,007
	Percent	5.71	17.24	5.60	71.45	100.00
TOTAL	Acres	1,504,219	3,129,709	241,562	111,330	4,986,820
	Percent	30.16	62.76	4.85	2.23	100.00

Source: Mississippi Automated Resource Information System (MARIS)

1/ Includes areas without a soil mapping unit. In most instances, these areas were not assigned to a major land resource area.

Table 3.3 Land capability subclass distribution by county and basin total, Subregion 0318, Pearl River Basin, Mississippi part

Land capability subclass	County										
	Attala	Choctaw	Copiah	Hancock	Hinds	Jefferson Davis	Kemper	Lamar	Lawrence	Leake	
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	
Unclassified	0	0	1,483	618	4,942	371	124	309	3,645	124	
1	0	0	8,835	0	0	2,718	0	0	10,132	0	
2e	3,027	927	52,389	7,846	17,422	57,764	2,286	24,835	56,220	10,379	
2s	0	0	0	0	0	0	0	1,174	0	0	
2w	25,268	9,699	37,871	8,711	24,403	11,985	6,178	1,792	26,380	48,621	
3e	21,005	34,287	20,386	0	52,328	20,511	22,179	2,533	19,462	52,884	
3s	0	0	0	988	0	494	0	0	3,212	0	
3w	17,607	0	0	1,544	371	1,421	0	0	22,426	5,993	
4e	2,348	4,263	0	0	12,664	12,480	12,480	20,140	12,171	59,062	
4s	0	0	0	0	2,719	0	0	0	0	0	
4w	15,074	3,707	0	25,083	8,340	1,112	0	7,415	2,163	35,152	
5w	0	4,634	12,480	433	0	15,260	11,676	618	34,473	30,086	
6e	32,559	36,203	20,079	185	3,336	12,665	0	36,573	8,031	39,725	
6s	0	0	0	0	0	0	0	1,049	0	0	
7e	103,049	0	36,574	0	0	50,042	6,054	0	80,808	82,723	
7w	0	0	0	0	0	0	0	618	0	0	
8w	0	0	0	10,441	0	0		0	0	0	
Totals	219,937	93,720	190,097	55,849	126,525	186,823	60,977	97,056	279,123	364,749	
Percent of County within basin	(46.69)	(34.91)	(38.04)	(17.74)	(22.54)	(71.30)	(12.44)	(30.15)	(100.00)	(97.39)	

Source: Mississippi Automated Resource Information System (MARIS)

Cont

Table 3.3 Land capability subclass distribution by county and basin total, Subregion 0318, Pearl River Basin, Mississippi part (continued)

Land capability subclass	County										
	Lincoln	Madison	Marion	Neshoba	Newton	Noxubee	Pearl River	Pike	Rankin	Scott
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Unclassified	2,101	10,441	3,954	556	185	0	1,792	1,544	18,594	0
1	0	0	0	0	0	0	741	0	0	0
2e	78,399	0	120,162	3,954	7,166	0	55,046	43,680	26,257	20,696
2s	0	0	0	0	0	0	6,487	617	0	0
2w	41,702	8,279	15,877	23,291	16,928	0	44,420	27,060	64,066	4,448
3e	51,462	42,875	0	30,087	17,237	185	57,579	14,209	171,997	82,044
3s	0	0	0	0	0	0	0	0	0	0
3w	3,707	0	8,773	27,925	10,008	0	0	6,116	0	66,599
4e	26,627	3,213	20,696	58,135	22,920	0	50,536	11,985	9,514	41,949
4s	0	0	0	0	0	0	0	0	0	0
4w	0	3,706	8,031	185	4,819	0	37,747	0	53,501	12,912
5w	10,626	12,171	48,806	53,254	0	0	37,687	0	5,313	53,872
6e	11,244	2,286	91,188	9,575	12,171	0	34,164	10,750	167,362	58,506
6s	0	0	0	0	62	0	0	0	0	0
7e	33,114	0	30,829	120,472	1,421	0	0	13,221	0	0
7w	0	0	0	0	0	0	9,081	0	0	0
8w	0	0	0	0	0	0	0	0	0	0
Totals	258,982	82,971	348,316	327,434	92,917	185	335,280	129,182	516,604	341,026
Percent of County within basin	(68.80)	(17.45)	(99.26)	(89.33)	(25.06)	(<0.01)	(63.97)	(49.10)	(100.00)	(87.07)

Source: Mississippi Automated Resource Information System (MARIS)

Cont

Table 3.3 Land capability subclass distribution by county and basin total, Subregion 0318, Pearl River Basin, Mississippi part (continued)

Land capability subclass	County									BASIN TOTAL
	Smith	Simpson	Walthall	Winston						
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Unclassified	185	309	1,544	186						53,007
1	0	0	1,668	0						24,094
2e	0	12,109	108,362	6,672						715,598
2s	0	0	865	0						9,143
2w	680	34,535	41,207	34,473						557,874
3e	0	58,445	28,789	63,695						864,179
3s	0	0	248	0						4,942
3w	0	0	2,286	247						175,023
4e	9,329	20,078	17,360	48,312						476,262
4s	0	0	0	0						2,719
4w	3,213	4,448	1,359	0						227,967
5w	14,580	37,500	8,464	40,404						432,337
6e	21,623	88,098	19,461	62						715,846
6s	0	0	0	0						1,111
7e	9,699	43,740	28,295	66,537						706,578
7w	0	0	0	0						9,699
8w	0	0	0	0						10,441
Totals	59,309	299,262	259,908	260,588						4,986,820
Percent of County within basin	(14.54)	(79.23)	(100.00)	(66.88)						(100.00)

Source: Mississippi Automated Resource Information System (MARIS)

Table 3.4 Land capability subclass distribution by hydrologic unit and basin total, Subregion 0318, Pearl River Basin, Mississippi part

Land capability subclass	Hydrologic unit name and number										
	Upper Pearl River (3811)	Tuscolameta Creek (3812)	Yockanookany River (3813)	Pearl River above Ross Barnett Dam (3821)	Pearl River above Strong River (3822)	Strong River (3823)	Middle Pearl River (3830)	Lower Pearl River (3840)	Bogue Chitto (3850)	BASIN TOTAL
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Unclassified	865	309	0	29,037	5,684	371	6,116	6,054	4,571	53,007
1	0	0	0	0	5,683	0	16,001	927	1,483	24,094
2e	14,086	15,383	7,475	44,420	33,670	5,869	189,541	205,233	199,921	715,598
2s	0	0	0	0	0	0	0	8,340	803	9,143
2w	100,331	24,341	40,713	15,692	82,663	40,713	83,835	73,580	96,006	557,874
3e	145,803	78,213	58,073	126,031	150,187	82,847	73,889	65,301	83,835	864,179
3s	0	0	0	0	0	0	3,706	989	247	4,942
3w	38,487	58,197	7,167	22,982	371	1,545	28,419	7,291	10,564	175,023
4e	144,009	60,792	13,097	11,862	23,352	42,505	36,203	93,535	50,907	476,262
4s	0	0	0	0	2,719	0	0	0	0	2,719
4w	14,333	6,672	31,199	50,659	36,388	5,807	2,780	78,337	1,792	227,967
5w	121,459	58,259	1,792	17,484	8,958	55,664	71,788	80,314	16,619	432,337
6e	36,821	48,374	71,418	57,826	77,657	170,945	66,662	150,805	35,338	715,846
6s	0	62	0	0	0	0	0	1,049	0	1,111
7e	285,856	18,163	75,495	741	23,662	33,917	203,009	29,408	36,327	706,578
7w	0	0	0	0	0	0	0	9,699	0	9,699
8w	0	0	0	0	0	0	0	10,441	0	10,441
Totals	902,050	368,765	306,429	376,734	450,994	440,183	781,949	821,303	538,413	4,986,820

Source: Mississippi Automated Resource Information System (MARIS)

Table 3.5. Major land use by capability subclass and basin total, Subregion 0318, Pearl River Basin, Mississippi part, present, 1975

Land capability subclass	Land use				TOTAL
	Agricultural	Forest	Urban and built-up	Other	
	Acres	Acres	Acres	Acres	Acres
Basin Totals					
Unclassified 1/	3,027	9,143	2,966	37,871	53,007
1	11,738	10,997	926	433	24,094
2e	355,173	315,201	39,353	5,871	715,598
2s	3,336	5,436	247	124	9,143
2w	208,076	307,664	32,805	9,329	557,874
3e	345,597	433,078	75,742	9,762	864,179
3s	741	4,015	62	124	4,942
3w	43,246	122,634	7,228	1,915	175,023
4e	160,689	282,953	27,863	4,757	476,262
4s	123	2,410	186	0	2,719
4w	21,191	190,097	6,610	10,069	227,967
5w	72,653	342,693	5,870	11,121	432,337
6e	166,929	519,013	23,293	6,611	715,846
6s	124	987	0	0	1,111
7e	109,969	574,926	17,978	3,705	706,578
7w	1,483	7,660	309	247	9,699
8w	124	802	124	9,391	10,441
TOTAL	1,504,219	3,129,709	241,562	111,330	4,986,820
Percent	30.16	62.76	4.85	2.23	100.00

Source: Mississippi Automated Resource Information System (MARIS)

1/ Includes all areas without a soil mapping unit.

Table 3.6. Dominant land capability subclass by major land resource area (MLRA) with soil series names, Subregion 0318, Pearl River Basin, Mississippi part

Land capability subclass	Percent of basin	Dominant soil series names by MLRA			
		133A	134	135	152A
1	0.49	Cahaba, Lucedale, Ruston	--	--	--
2e	14.35	Cahaba, Malbis, McLaurin, Ora, Prentiss, Ruston, Savannah	Bude, Byram, Dulac, Grenada, Providence	Brooksville	--
2s	0.18	Latonia, McLaurin	--	--	--
2w	11.19	Escambia, Iuka, Jena, Kirkville, Mantachie, Ochlockonee, Paden, Prentiss, Stough	Ariel, Arkabutla, Bude, Calloway, Falaya, Gillsburg, McRaven, Oaklimeter, Riedtown, Tippo	Houlka	Basin
3e	17.33	Malbis, Neshoba, Ora, Paden, Ruston, Savannah, Shubuta, Sweatman	Dulac, Falkner, Providence, Siwell, Tippah	Kipling	--
3s	0.10	Alaga, Darco, Eustis	--	--	--
3w	3.51	Adaton, Bibb, Guyton, Pheba, Rosella, Wanilla	Calhoun, Henry, Waverly	Una, Vaiden	--
4e	9.55	Cadeville, Freestone, Ora, Savannah, Shubuta, Smithdale, Sweatman	Dulac, Falkner, Loring, Providence	Kipling, Vaiden	--
4s	0.05	--	Bonn	--	--
4w	4.57	Atmore, Leaf, Mashulaville, Myatt, Trebloc	Arkabutla, Cascilla, Oaklimeter	Eutaw, Urbo	Plummer
5w	8.67	Bibb, Harleston, Iuka, Jena, Kinston, Kirkville, Mantachie	Rosebloom, Waverly	--	--
6e	14.35	Heidel, Kisatchie, Smithdale, Susquehanna, Williamsville	Memphis, Providence	Sumter	--
6s	0.02	Lakeland	--	--	--
7e	14.17	Cadeville, Lorman, Pikeville, Saffell, Smithdale, Sweatman, Williamsville	(Gullied)	--	--
7w	0.20	Dorovan	--	--	--
8w	0.21	--	--	--	Handsboro
Unclassified	1.06				
TOTAL	100.00				

Source: Soil Conservation Service, United States Department of Agriculture.

Southern Mississippi Valley Silty Upland, MLRA 134

The Southern Mississippi Valley Silty Upland (MLRA 134) occurs primarily within the western part of the Pearl River Basin. A total of about 1.3 million acres or 26.9 percent of the Mississippi part of the basin occur in the MLRA 134. Topography is generally hilly to steep with high-gradient streams dissecting the area. The loess cap (silt) that is characteristic of the MLRA becomes thinner from west to east. Valley sides are hilly to steep. Intervening ridges are mostly narrow, but some of these ridges between the upper reaches of the valleys are broad and flat. Unconsolidated sands, silts, and clays of mostly marine origin underlie the area.

The major land uses for MLRA 134 are 60.2 percent forest, 30.7 percent agricultural, 7.4 percent urban and built-up, and 1.7 percent in the other category. Refer to Table 3.2.

About 53.3 percent of the soil resources of the MLRA has erosion hazards and 46.5 percent has water hazards. The remaining 0.2 percent has a soil characteristic hazard. Refer to Table 3.1.

Upland soils are dominated by Bude, Dulac, Falkner, Loring, Memphis, and Providence series. Principal bottomland soils include Arkabutla, Cascilla, Falaya, Gillsburg, Oaklimeter, and Tippo series. Refer to Table 3.6 for more details.

Alabama, Mississippi, and Arkansas Blackland Prairies, MLRA 135

MLRA 135, located in the upper central part of the basin, makes up about 4.3 percent of the study area or about 212.9 thousand acres. The area is nearly level to gently sloping with local relief limited to a few tens of feet. The area is underlain primarily by clay.

Refer to Table 3.6 for dominant soils of each land capability subclass.

The major land uses of MLRA 135 are 64.6 percent forest, 28.3 percent agricultural, and 7.1 percent urban and built-up and other. See Table 3.2.

Erosion hazards are of concern on 60.5 percent of the soil resources of MLRA 135. Water hazards are concerns on the remaining 39.5 percent. Table 3.1 lists the acres for each of the land capability subclasses of the MLRA.

Principal soils on the uplands are of the Brooksville and Kipling series. Bottomland soils include the Houlka and Urbo series.

Other Major Land Resource Areas and Areas

The remaining 1.3 percent or about 67.3 thousand acres of the Mississippi part of the Pearl River Basin consists of the Eastern Gulf Coast Flatwoods (MLRA 152A) and of unclassified soil areas. The MLRA 152A extends several miles inland from the Gulf of Mexico and is made up of nearly level flatwoods. The unclassified areas are located throughout the basin and include areas without a recognized soil classification.

Refer to Tables 3.1, 3.2, and 3.6 for land use, soil resource distribution and dominant soils of MLRA 152A.

Soil Resources

The Pearl River Basin has a variety of soil resources. These soil resources dictate to a great degree the use of the land. The major land use for the basin is forest, with about 62.8 percent of the total area. Agricultural use amounts to 30.2 percent of the basin's area.

The 2.4 million acres that are in Land Capability Classes 1, 2, and 3 account for 47.1 percent of the total study area. About 41.2 percent of the 2.4 million acres (967.9 thousand acres) are being used for agriculture. Of the 1.5 million acres being used for agricultural purposes throughout the basin, 64.3 percent is on Land Capability Classes 1, 2, and 3.

The 706.9 thousand acres in Land Capability Class 4 account for 14.2 percent of the total area. About 25.7 percent of this total is being used for agricultural purposes. The remaining areas of the basin are in Land Capability Classes 5, 6, 7, and 8 or in the unclassified group. These areas total about 1.9 million acres or about 38.7 percent of the total study area. About 354.3 thousand acres or about 18.4 percent of the 1.9 million acres are being used for agricultural purposes. Refer to Table 3.5 for more details. Table 3.1 lists a distribution of the land capability subclasses by MLRAs.

These tables also may be used to summarize the land capability subclasses by hazards or limitation. Land Capability Subclass 1, with few limitations, totals about 24.1 thousand acres or less than 1.0 percent. Land capability subclasses with soil characteristics hazards total about 70.9 thousand acres or 1.4 percent of the total basin. Soils with water hazards total 1.4 million acres or 28.3 percent. Erosion hazard soils account for most of the soil resources of the basin with 3.5 million acres or about 69.8 percent. Refer to Table 3.5 for more details.

The soils of the basin vary by county and by hydrologic units. Table 3.3 lists the acres of each county within the Pearl River Basin by land capability subclass. The percent of each county within the basin is also included in the table. Table 3.4 lists the acres of each hydrologic unit by land capability subclass.

Population

Total population in the area grew rapidly during the 1970's, after a decade of relatively little change. The average annual growth in population in the area during the 1970 decade was two percent compared with a statewide growth rate of 1.5 percent. A large part of the increase occurred in those counties immediately adjacent to the Jackson metropolitan area (Hinds, Madison, and Rankin). These counties, designated as the Reservoir Area of the basin, showed an increase of 73,395 persons, which represents over 57 percent of the basin's population growth during the seventies (see Table 3.7).

Table 3.7. Rural and urban population, selected years, by area and basin total, Pearl River Basin, Mississippi

Area	Rural		Urban		Total
	Number	Percent	Number	Percent	
Upper Pearl River					
1960	117,580	83.1	23,992	16.9	141,572
1970	101,378	75.2	33,510	24.8	134,888
1980	105,195	72.3	40,367	27.7	145,562
Reservoir					
1960	89,439	35.2	164,832	64.8	254,271
1970	90,510	31.4	198,133	68.6	288,643
1980	93,547	25.8	268,491	74.2	362,038
Middle Pearl River					
1960	94,549	84.2	17,773	15.8	112,322
1970	86,098	79.3	22,445	20.7	108,543
1980	83,738	68.9	37,821	31.1	121,559
Lower Pearl River					
1960	89,946	73.7	32,047	26.3	121,993
1970	87,699	68.7	39,883	31.3	127,582
1980	113,392	71.9	44,403	28.1	157,795
Basin Totals					
1960	391,514	62.1	238,644	37.9	630,158
1970	365,685	55.4	293,971	44.6	659,656
1980	395,872	50.3	391,082	49.7	786,954

Source: Bureau of Census, U.S. Department of Commerce.

Significantly, the basin's rural population showed an increase during the 1970's, following a pattern that occurred in many rural areas throughout the United States. The increase in the seventies followed several decades of declining rural population. Rural population in 1980 was about one-half total population; and, while there was an increase of 30,000 people in this category, the relative size of the rural component was about 5 percent less in 1980 than 1970.

General Land Use

Overall

Land use classifications for the study are from the Mississippi Data Base, a computer retrieval system consisting of land use, soils, and geographic locations for the State of Mississippi. The land use classifications are based on the U. S. Geological Survey land cover classification and consist of 51 separate uses. However, for this report land uses are combinations of the 51 uses. There are eleven primary uses with the breakdown of subuses varying for each primary use. This report contains land use tables with 27 separate uses. These 27 separate uses are combined into four major land use categories. Refer to Table 3.8 for a listing of 51 land uses and to Table 3.9 for a listing of the 27 land use groups.

The major land use classifications are (1) residential, commercial, industrial, transportation, institutional, and open space or urban and built-up areas; (2) cropland and pasture, orchards, feeding operations, and other or agricultural areas; (3) deciduous, evergreen, mixed and other or forest areas; and (4) water, wetlands, and barren or other areas. Swamp classification, in most cases, is grouped with forest areas. The agriculture classification does not include any forest cover classifications.

Table 3.9 shows land use data by the nine hydrologic units and three cataloging units that comprise the Mississippi part of the Pearl River Basin. The data are shown for 27 land use classifications. The study area consists of about 5.0 million acres. Cropland and pasture totals about 1.5 million acres and is the largest individual use. The classifications of evergreen forest and mixed forest, each with 1.2 million acres, are the next major uses. Refer to the table for other uses and for uses within each of the geographic areas shown--basin and hydrologic unit.

Table 3.10 is land use data for the parts of the 24 Mississippi counties that comprise the study area. Refer to the table for data as discussed above. Three of the counties--Lawrence, Rankin, and Walthall--are entirely within the basin.

Land use varies throughout the Pearl River Basin by hydrologic units and counties and also by major land resource areas and land capability class and subclass.

Table 3.11 lists the major land uses of the basin by hydrologic units. The forest group with about 62.8 percent of the basin's area is the largest; agriculture with about 30.2 percent is next; and urban and built-up and other

Table 3.8. Land use legend and symbol, Mississippi Data Base Component, Mississippi Statewide Cooperative River Basin Study

Unit	Symbol
RESIDENTIAL	
Single Family	Rs
Multi-Family	Rm
Mobile Home	Rt
Undeveloped	Ru
Other	Ro
COMMERCIAL	
Central Business District	Cb
Shopping Center	Cc
Strip	Cs
Rural	Cr
Other	Co
INDUSTRIAL	I
TRANSPORTATION, COMMUNICATION, AND UTILITIES	
Highway Right-of-Way	RWh
Railroad Right-of-Way	RWr
Port Facilities	PF
Airport Facilities	Ta
Power Transmission Right-of-Way	RWt
Pipeline Right-of-Way	RWp
Utilities	UT
Communication	Cm
Other	To
INSTITUTIONAL (PUBLIC AND SEMI-PUBLIC)	
Educational	Pu
Religious	Pr
Cemeteries	Pc
Health Care Facilities	Ph
Governmental	Pg
Military Facility	Pm
Other	Po
OPEN SPACE	
Parks, Playgrounds, and Campgrounds	Op
Golf Courses	Og
Other Open Space	Oo
AGRICULTURAL	
Cropland and Pasture	Ac
Orchards	Ah
Feeding Operations (Fish and Livestock)	Af
Other	Ao
FOREST	
Deciduous	Fd
Evergreen	Fe
Mixed	Fm
Other	Fo
WATER	
Rivers and Streams	Ws
Lakes	Wl
Reservoirs	Wr
Bays and Estuaries	Wb
Ponds	Wp
Other	Wo
WETLANDS	
Fresh Water Marsh	WMf
Salt Water Marsh	WMs
Swamp (Forested Wetlands)	Wf
BARREN	
Extractive	Be
Beaches	Bb
Sand Other Than Beaches	Bs
Other	Bo

Table 3.9 Land use by hydrologic unit and basin, data base classification, Pearl River Basin, Subregion 0318, Mississippi part, present, 1975

Data base classification	Hydrologic unit code and name: Upper Pearl River (3811)	Tuscolameta Creek (3812)	Yockanookany River (3813)	Total for cataloging unit 03180001	Hydrologic unit code and name: Pearl River above Ross Reservoir Dam (3821)	Pearl River above Strong River (3822)	Strong River (3823)	Total for cataloging unit 03180002	Total for cataloging unit 03180003 Middle Pearl River (3830)	Total for cataloging unit 03180004 Lower Pearl River (3840)	Total for cataloging unit 03180005 Bogue Chitto (3850)	BASIN TOTAL
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Acres
Residential	24,463	10,193	8,773	43,429	7,167	36,327	8,587	52,081	11,924	16,125	16,372	139,931
Commercial	1,112	432	494	2,038	124	5,313	494	5,931	556	680	680	9,885
Industrial	494	62	371	927	62	2,224	247	2,533	618	247	494	4,819
Transportation, Communication, and Utilities	11,800	4,201	4,757	20,758	4,634	14,518	6,487	25,639	10,008	6,796	7,352	70,553
Institutional	1,236	432	371	2,039	741	3,398	556	4,695	556	1,112	1,112	9,514
Open Space	309	0	247	556	680	4,510	0	5,190	494	309	309	6,858
Agricultural												
Cropland and pasture	267,693	122,819	78,213	468,725	88,654	126,587	97,242	312,483	237,050	258,796	218,886	1,495,940
Orchards	0	124	62	186	0	185	62	247	62	309	62	866
Feeding operations	1,606	1,730	185	3,521	988	185	2,224	3,397	62	185	185	7,350
Other	0	0	0	0	0	0	0	0	62	0	0	62
Forest												
Deciduous	157,354	34,473	61,533	253,360	50,350	72,900	37,439	160,689	42,072	35,276	19,770	511,167
Evergreen	192,136	113,737	88,716	394,589	111,451	85,009	142,588	339,048	201,217	200,538	113,057	1,248,449
Mixed	219,319	51,586	56,405	327,310	54,490	73,395	135,854	263,739	252,927	226,980	148,457	1,219,413
Other	4,016	4,510	3,213	11,739	6,919	7,105	3,089	17,113	7,290	32,558	4,201	72,901
Water												
Rivers and streams	3,213	1,915	865	5,993	2,039	2,965	1,668	6,672	3,707	7,352	2,348	26,072
Lakes	124	0	0	124	247	309	309	865	247	927	185	2,348
Reservoirs	4,819	2,965	1,050	8,834	26,071	6,054	2,286	34,411	3,336	5,004	3,398	54,983
Bays and estuaries	0	0	0	0	0	0	0	0	0	62	0	62
Ponds	556	124	62	742	185	124	62	371	494	494	185	2,286
Other	371	62	0	433	0	556	0	556	62	62	0	1,113
Wetlands												
Fresh water marsh	247	371	0	618	1,112	124	62	1,298	556	1,049	62	3,583
Salt water marsh	0	0	0	0	0	0	0	0	0	9,514	0	9,514
Swamp	10,873	18,781	1,050	30,704	19,893	6,240	185	26,318	6,919	13,592	247	77,780
Barren												
Extractive	62	124	62	248	62	1,730	618	2,410	865	1,977	680	6,180
Beaches	0	0	0	0	0	0	0	0	0	0	0	0
Sand	62	62	0	124	0	0	0	0	556	185	247	1,112
Other	185	62	0	247	865	1,236	124	2,225	309	1,174	124	4,079
TOTAL	902,050	368,765	306,429	1,577,244	376,734	450,994	440,183	1,267,911	781,949	821,303	538,413	4,986,820

Source: Mississippi Data Base.

Table 3.10 Land use by county and basin, data base classification, Pearl River Basin, Subregion 0318, Mississippi part, present, 1975

Data base classification	County name												
	Attala	Choctaw	Copiah	Hancock	Hinds	Jefferson Davis	Kemper	Lamar	Lawrence	Leake	Lincoln	Madison	Marion
	Acres												
Residential	6,177	2,409	4,202	1,112	22,736	2,533	1,359	494	4,634	8,958	6,734	2,040	4,387
Commercial	309	184	247	62	3,768	124	62	0	124	309	555	247	247
Industrial	309	62	185	0	1,297	247	0	0	185	0	371	124	62
Transportation, Communication, and Utilities	3,398	988	2,348	1,173	4,757	3,027	865	556	3,892	3,954	3,954	1,359	2,162
Institutional	185	124	371	618	2,286	124	432	0	62	432	556	247	124
Open Space	124	124	185	62	3,336	0	0	0	308	0	309	62	0
Agricultural													
Cropland and pasture	49,548	21,129	57,641	865	41,454	79,201	23,415	22,859	68,637	107,188	79,017	26,874	121,583
Orchards	62	0	124	0	62	0	0	0	0	0	0	0	62
Feeding operations	62	0	0	0	0	62	0	0	0	1,112	0	0	124
Other	0	0	62	0	0	0	0	0	0	0	0	0	0
Forest													
Deciduous	49,053	20,696	12,850	7,290	20,820	1,977	12,109	432	18,102	41,516	20,882	6,178	618
Evergreen	53,625	36,944	35,894	21,005	12,788	25,268	10,008	14,889	94,771	81,920	74,321	14,827	71,912
Mixed	52,266	10,132	71,541	3,954	5,498	71,788	11,800	55,046	72,962	97,674	66,661	6,117	133,939
Other	3,027	371	371	5,684	1,174	1,050	0	1,297	5,066	5,375	2,471	556	1,606
Water													
Rivers and streams	618	124	741	1,730	1,174	0	0	124	2,533	2,224	494	1,112	3,213
Lakes	0	0	62	247	185	62	0	0	124	123	0	62	556
Reservoirs	803	247	1,050	62	2,348	618	371	617	1,174	1,236	1,853	9,699	1,976
Bays and estuaries	0	0	0	62	0	0	0	0	0	0	0	0	0
Ponds	0	62	185	62	0	124	62	62	185	0	0	0	185
Other	124	0	0	62	309	0	0	0	62	124	0	0	0
Wetlands													
Fresh water marsh	0	0	62	988	0	0	0	0	495	62	0	309	0
Salt water marsh	0	0	0	9,514	0	0	0	0	0	0	0	0	0
Swamp	185	124	803	185	1,915	494	494	124	5,004	12,356	62	12,911	4,448
Barren													
Extractive	62	0	988	124	62	0	0	556	247	0	680	62	989
Beaches	0	0	0	0	0	0	0	0	0	0	0	0	0
Sand	0	0	185	0	0	0	0	0	371	62	0	0	123
Other	0	0	0	988	556	124	0	0	185	124	62	185	0
TOTAL	219,937	93,720	190,097	55,849	126,525	186,823	60,977	97,056	279,123	364,749	258,982	82,971	348,316

continued

Table 3.10 Land use by county and basin, data base classification, Pearl River Basin, Subregion 0318, Mississippi part, present, 1975 (continued)

Data base classification	County name											State total for basin
	Neshoba	Newton	Noxubee	Pearl River	Pike	Rankin	Scott	Simpson	Smith	Walthall	Winston	
	Acres											
Residential	10,196	1,606	0	10,007	4,693	16,929	9,143	5,558	742	5,683	7,599	139,931
Commercial	494	62	0	371	124	1,174	556	309	124	124	309	9,885
Industrial	309	0	0	185	124	865	124	185	0	0	185	4,819
Transportation, Communication, and Utilities	4,449	1,298	0	3,583	1,359	11,183	4,757	4,448	309	2,718	4,016	70,553
Institutional	432	185	0	371	247	1,297	432	371	62	432	124	9,514
Open Space	247	0	0	247	0	1,730	62	0	0	0	62	6,858
Agricultural												
Cropland and pasture	100,207	29,037	62	110,154	46,953	119,853	100,825	68,390	13,097	124,610	83,341	1,495,940
Orchards	0	0	0	246	62	124	124	0	0	0	0	866
Feeding operations	556	556	0	62	185	1,605	1,605	680	556	0	185	7,350
Other	0	0	0	0	0	0	0	0	0	0	0	62
Forest												
Deciduous	53,254	4,510	123	23,415	124	92,609	40,528	15,877	4,386	11,244	52,574	511,167
Evergreen	61,656	28,728	0	103,729	23,971	154,944	126,834	71,171	17,298	45,038	66,908	1,248,449
Mixed	86,492	17,916	0	42,319	49,239	72,344	40,219	122,201	21,870	65,981	41,454	1,219,413
Other	1,359	618	0	24,774	0	9,205	2,471	5,128	0	1,174	124	72,901
Water												
Rivers and streams	1,421	556	0	2,718	1,359	1,668	989	1,730	494	494	556	26,072
Lakes	0	0	0	124	185	185	124	124	185	0	0	2,348
Reservoirs	2,224	803	0	2,533	247	19,461	2,780	1,421	124	1,792	1,544	54,983
Bays and estuaries	0	0	0	0	0	0	0	0	0	0	0	62
Ponds	431	62	0	247	124	185	62	62	62	62	62	2,286
Other	62	0	0	0	0	246	0	0	0	0	124	1,113
Wetlands												
Fresh water marsh	247	184	0	62	62	803	124	185	0	0	0	3,583
Salt water marsh	0	0	0	0	0	0	0	0	0	0	0	9,514
Swamp	3,274	6,734	0	9,515	62	7,969	9,082	618	0	124	1,297	77,780
Barren												
Extractive	0	62	0	371	0	865	185	680	0	185	62	6,180
Beaches	0	0	0	0	0	0	0	0	0	0	0	0
Sand	62	0	0	62	62	0	0	0	0	185	0	1,112
Other	62	0	0	185	0	1,360	0	124	0	62	62	4,079
TOTAL	327,434	92,917	185	335,280	129,182	516,604	341,026	299,262	59,309	259,908	260,588	4,986,820

Source: Mississippi Data Base.

Table 3.11 Major land use in percents by hydrologic unit and basin, Pearl River Basin, Subregion 0318, Mississippi part, present, 1975.

Hydrologic unit name and code	Agriculture	Forest	Urban and built-up	Other	TOTAL
	Percent	Percent	Percent	Percent	Percent
Upper Pearl River (3811)	29.85	64.70	4.38	1.07	100.00
Tuscolameta Creek (3812)	33.81	60.50	4.15	1.54	100.00
Yockanookany River (3813)	25.60	68.83	4.90	0.67	100.00
Pearl River above Ross Barnett Reservoir Dam (3821)	23.79	64.53	3.56	8.12	100.00
Pearl River above Strong River (3822)	28.15	54.25	14.70	2.90	100.00
Strong River (3823)	22.61	72.50	3.72	1.17	100.00
Middle Pearl River (3830)	30.34	65.27	3.09	1.30	100.00
Lower Pearl River (3840)	31.57	61.97	3.08	3.38	100.00
Bogue Chitto (3850)	40.70	53.07	4.89	1.34	100.00
Pearl River Basin Totals	30.16	62.76	4.84	2.24	100.00

Source: Mississippi Automated Resource Information System (MARIS)

make up the remaining 7.0 percent. Land use varies for each of the hydrologic units. Forest use ranges from about 53.1 percent in the Bogue Chitto hydrologic unit to 72.5 percent in the Strong River hydrologic unit. Agricultural use ranges from about 22.6 percent in the Strong River hydrologic unit to 40.7 percent in the Bogue Chitto hydrologic unit. The Pearl River above Strong River hydrologic, unit that includes the cities of Jackson and Pearl, contains the largest urban and built-up use, 14.7 percent. Refer to the table for more details.

Table 3.12 lists the major land uses of the basin for each of the counties that make up the Pearl River Basin in Mississippi. Only the area within the basin is included for each county. Refer to the table for details as discussed above for the hydrologic units.

Land in Farms

Farmland by major use and by basin subareas is given in Table 3.13. Total farmland has declined by some 2 million acres since 1959, a decrease of about 40 percent. Nearly 1.3 million acres of this is found in reduced woodland acreage; part of this change can be attributed to definitional changes in census reporting, but the major portion is land converting from farms to forest land.

Total cropland has remained fairly constant since 1959, with the portion of cropland harvested falling from 50.7 percent to 46.5 percent in 1978. This ratio tends to fluctuate widely, as indicated by the data in Table 3.13, with price swings and unusual weather conditions the principal causes. Cropland pastured increased sharply during the 1960's and early 1970's as a result of favorable cattle prices. Acreage in this category dropped off in the latter part of the 1970's, but still accounted for nearly half the cropland base.

Following trends found almost universally, farm size has been increasing, with a corresponding reduction in the number of farms. The average farm in the area is now 209 acres; the number of farms in 1978 was only about one-third the total of 1959.

Prime Farmland

The soil resources of the Pearl River Basin vary in quality. Generally, however, the soils are capable of producing high yields of agricultural products. The Mississippi part of the Pearl River Basin contains about 1.4 million acres of soils that are recognized as prime farmland and unique farmland. This total is about 28.2 percent of the study area.

Prime farmland includes soils that are best suited for producing commonly grown crops at sustained high yields, when treated and managed according to modern farming methods--urban and built-up areas and water are excluded. They have adequate moisture supplies and specifically beneficial natural soil qualities. These soils have a mean annual temperature higher than 59°F, have a rooting zone pH range between 4.5 and 8.4, lack a root inhibiting water table, are not frequently flooded during the growing season, and do not have a serious erosion hazard. These soils generally have less than 5 percent average slope gradients.

Table 3.12. Major land use in percent by county and basin, Pearl River Basin, Subregion 0318, Mississippi part, present, 1975

County name	Agriculture	Forest	Urban and built-up	Other	TOTAL
	Percent	Percent	Percent	Percent	Percent
Attala	22.58	71.91	4.78	0.73	100.00
Choctaw	22.55	72.84	4.15	0.46	100.00
Copiah	30.42	63.89	3.97	1.72	100.00
Hancock	1.55	68.25	5.42	24.78	100.00
Hinds	32.81	33.35	30.18	3.66	100.00
Jefferson Davis	42.43	53.83	3.24	0.50	100.00
Kemper	38.40	56.43	4.46	0.71	100.00
Lamar	23.55	73.97	1.08	1.40	100.00
Lawrence	24.59	70.18	3.30	1.93	100.00
Leake	29.69	65.48	3.74	1.09	100.00
Lincoln	30.51	63.48	4.82	1.19	100.00
Madison	32.39	48.92	4.92	13.77	100.00
Marion	34.96	61.01	2.01	2.02	100.00
Neshoba	30.77	62.92	4.93	1.38	100.00
Newton	31.85	62.97	3.39	1.79	100.00
Noxubee	33.51	66.49	0	0	100.00
Pearl River	32.95	60.77	4.40	1.88	100.00
Pike	36.54	56.81	5.07	1.58	100.00
Rankin	23.53	65.25	6.42	4.80	100.00
Scott	30.07	64.26	4.42	1.25	100.00
Simpson	23.08	71.84	3.63	1.45	100.00
Smith	23.02	73.44	2.08	1.46	100.00
Walthall	47.94	47.54	3.45	1.07	100.00
Winston	32.05	62.30	4.72	0.93	100.00
Basin Total	30.16	62.76	4.84	2.24	100.00

Source: Mississippi Automated Resource Information System (MARIS)

Table 3.13 Farmland use by areas and basin total for selected years, Pearl River Basin, Mississippi

Areas	Total cropland	Harvested cropland	Cropland pastured	Other cropland	Woodland	Other land	Total farmland	Number of farms	Farm size average
	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Number	Acres
Upper Pearl River									
1959	478,482	288,525	108,270	81,687	832,067	476,436	1,786,985	16,325	110.0
1964	375,685	230,897	75,619	69,169	822,069	481,907	1,679,661	13,857	121.0
1969	542,390	169,117	280,283	92,990	572,545	308,202	1,423,137	9,531	149.0
1974	508,509	166,654	311,363	30,492	438,801	217,431	1,164,741	7,250	161.0
1978	502,839	223,963	244,599	34,277	416,534	153,989	1,073,362	5,650	190.0
Reservoir									
1959	377,035	171,781	156,101	49,153	368,516	342,664	1,088,215	7,852	138.6
1964	301,855	143,043	122,721	36,091	316,354	379,389	997,598	5,814	171.6
1969	423,265	164,940	215,266	43,059	252,096	264,053	939,414	4,109	228.6
1974	427,296	189,776	212,385	25,135	194,826	233,225	855,347	2,928	292.1
1978	405,893	237,177	141,455	27,261	196,926	154,928	757,747	2,436	311.1
Middle Pearl River									
1959	348,763	174,325	125,287	49,151	702,137	326,487	1,377,387	11,223	122.7
1964	290,353	148,912	97,973	43,468	617,665	381,244	1,289,262	9,762	132.1
1969	411,365	109,698	244,656	57,011	420,093	192,696	1,024,154	6,576	155.7
1974	368,097	111,399	236,804	19,894	343,296	154,992	866,385	4,779	181.3
1978	361,132	148,121	193,972	19,039	289,272	110,821	761,225	3,944	193.0
Lower Pearl River									
1959	405,905	182,083	177,902	45,920	481,347	110,021	997,273	8,711	114.5
1964	356,416	171,169	147,115	38,132	464,704	171,232	992,352	8,093	122.6
1969	342,591	110,772	185,746	46,073	311,205	129,524	783,320	4,837	161.9
1974	336,753	105,380	213,296	18,077	243,308	129,485	709,546	3,880	182.9
1978	334,767	137,602	173,984	23,181	205,160	75,131	615,058	3,325	185.0
BASIN TOTALS:									
1959	1,610,185	816,714	567,560	225,911	2,384,067	1,255,608	5,249,860	44,111	119.0
1964	1,324,309	694,021	443,428	186,860	2,220,792	1,413,772	4,958,873	37,526	132.1
1969	1,719,611	554,527	925,951	239,133	1,555,939	894,475	4,170,025	25,053	166.4
1974	1,640,655	573,209	973,848	93,598	1,220,231	735,133	3,596,019	18,837	190.9
1978	1,604,631	746,863	754,010	103,758	1,107,892	494,869	3,207,392	15,355	208.9

Source: Census of Agriculture, Bureau of the Census.

Unique farmlands are farmlands other than prime farmland that respond unusually well for the production of specialized crops, such as fruits and vegetables.

Important farmland is a category that has a special significance to local areas. Data on the quantity and location of these important farmlands are not available.

Prime and unique farmlands are mostly of Land Capability Classes 1 and 2, with a few soils in Class 3 in the Delta (MLRA 131), Southern Coastal Plain (MLRA 133A), and Alabama, Mississippi, and Arkansas Blackland Prairies (MLRA 135) land resource areas.

Tables 3.14, 3.14A, and 3.15 present data on prime and unique farmlands of the basin. Prime and unique farmlands are found throughout the basin in all hydrologic units and in all counties but Noxubee. However, Noxubee County only has a total of 185 acres within the basin. Major land uses--agricultural, forest, and other--are shown in the tables. Forested land with 50.4 percent of the total is the largest use. Agriculture (42.7 percent) and other (6.9 percent) make up the remaining uses.

The Lower Middle Pearl River, Lower Pearl River, and Bogue Chitto hydrologic units all contain more than 288.0 thousand acres of prime and unique farmlands. Within Mississippi, Leake, Marion, Pearl River, Rankin, and Walthall Counties each contains more than 100.0 thousand acres of prime and unique farmlands within the Pearl River Basin.

Of the total agricultural land in the Pearl River Basin only 40 percent is considered prime farmland. This varies from 16 percent in the Strong River hydrologic unit to 61 percent in the Bogue Chitto hydrologic unit. (See Table 3.14A)

Refer to Tables 3.14 and 3.15 for more details for the hydrologic units and counties.

Water

The Mississippi part of the Pearl River Basin has abundant surface water resources. Rivers and streams, lakes, reservoirs, ponds, fresh water marshes, and swamps are found throughout the basin, as is apparent from the land use classification of the Mississippi Data Base. Near the coast, salt water marshes are found. The total area of all surface water within the basin equals about 177.8 thousand acres, including 77.8 thousand acres of swamps. This swamp area is included within the forest group where major land uses are displayed in this report. Tables 3.9 and 3.10 list the surface water acres by the various classification for each of the hydrologic units and counties and also for the basin. The various classifications are discussed below.

Stream Systems

The rivers and streams of the basin, as tabulated in Tables 3.9 and 3.10, total 26.1 thousand acres. The Lower Pearl River hydrologic unit, with about

Table 3.14. Land use on prime and unique farmlands by hydrologic unit[1/], Pearl River Basin, 1975

Hydrologic unit Name	Code	Agri-culture Acres	Forest Acres	Other Acres	Total Acres
Upper Pearl River (a portion of 03180001)	3811	56,219	51,833	6,364	114,416
Tuscolameta Creek (a portion of 03180001)	3812	22,673	45,099	5,560	73,332
Yockanookany River (a portion of 03180001)	3813	22,920	22,859	2,409	48,188
Pearl River above Ross Barnett Reservoir (a portion of 03180002)	3821	41,330	73,518	7,043	121,891
Pearl River above Strong River (a portion of 03180002)	3822	47,385	56,837	19,647	123,869
Strong River (a portion of 03180002)	3823	15,693	29,840	2,594	48,127
Lower Middle Pearl River (03180003)	3830	122,139	152,412	14,827	289,378
Lower Pearl River (03180004)	3840	137,028	131,591	19,461	288,080
Bogue Chitto (03180005)	3850	134,557	144,443	19,212	298,212
Total		599,944	708,432	97,117	1,405,493
Percent		42.69	50.40	6.91	100.00

Source: Mississippi Data Base.

1/ Mississippi portion only.

Table 3.14A. Prime and unique agricultural farmlands as a part of total agricultural land by hydrologic units 1/, Pearl River Basin, 1975

Hydrologic unit		Prime and unique agricultural farmlands	Total agricultural land	Prime and unique farmland as a part of total agricultural
Name	Code	Acres	Acres	Percent
Upper Pearl River (a portion of 03180001)	3811	56,219	269,299	20.9
Tuscolameta Creek (a portion of 03180001)	3812	22,673	124,673	18.2
Yockanookany River (a portion of 03180001)	3813	22,920	78,460	29.2
Pearl River above Ross Barnett Reservoir (a portion of 03180002)	3821	41,330	89,642	46.1
Pearl River above Strong River (a portion of 03180002)	3822	47,385	126,957	37.3
Strong River (a portion of 03180002)	3823	15,693	99,528	15.8
Lower Middle Pearl River (03180003)	3830	122,139	237,236	51.5
Lower Pearl River (03180004)	3840	137,028	259,290	52.8
Bogue Chitto (03180005)	3850	134,557	219,133	61.4
Total	0318	599,944	1,504,218	39.9

Source: Mississippi Data Base.

1/ Mississippi portion only.

Table 3.15. Land use on prime and unique farmlands by county[1/], Pearl River Basin, 1975

County Name	Code	Agriculture Acres	Forest Acres	Other Acres	Total Acres
Attala	007	12,912	13,777	1,606	28,295
Choctaw	019	5,004	5,190	432	10,626
Copiah	029	37,809	54,800	6,487	99,096
Hancock	045	185	14,580	1,792	16,557
Hinds	049	19,090	13,592	9,143	41,825
Jefferson Davis	065	39,972	29,407	3,089	72,468
Kemper	069	4,510	3,521	432	8,463
Lamar	073	9,514	17,607	680	27,801
Lawrence	077	36,883	50,289	5,560	92,732
Leake	079	64,004	86,801	3,645	154,450
Lincoln	085	4,572	11,985	8,093	24,650
Madison	089	3,521	4,139	618	8,278
Marion	091	73,086	56,776	6,178	136,040
Neshoba	099	13,344	12,418	1,483	27,245
Newton	101	8,896	13,715	1,606	24,217
Noxubee	103	0	0	0	0
Pearl River	109	52,822	42,566	11,306	106,694
Pike	113	29,037	37,563	4,757	71,357
Rankin	121	44,234	78,275	13,530	136,039
Scott	123	21,252	52,575	4,263	78,090
Simpson	127	17,916	25,206	3,521	46,643
Smith	129	124	556	0	680
Walthall	147	86,677	70,429	6,981	164,087
Winston	159	14,580	12,665	1,915	29,160
Total		599,944	708,432	97,117	1,405,493
Percent		42.69	50.40	6.91	100.00

Source: Mississippi Data Base.

1/ Pearl River Basin portion only, Mississippi counties.

7.4 thousand acres, has the most acres. The basin is estimated to have about 2.6 thousand miles of perennial streams.

The streams of the basin vary in size by drainage area. Table 3.16 is a breakdown of these streams for each of the nine hydrologic units by drainage area groups.

The Pearl River Basin contains 74 individual streams with drainage areas of from 10 to 15 square miles. There are 48 streams in the 15 to 20 square mile size; 18 streams each in the 50 to 100 and the 100 to 400 square mile size. Nine streams exceed 400 square miles in size. The smaller tributaries are included in the total drainage area of the larger individual streams. Refer to the table for more groups and details.

Lakes, Reservoirs, and Ponds

Lakes, reservoirs, and ponds total about 59.6 thousand acres. The hydrologic unit, Pearl River above Ross Barnett Reservoir, has the most area in this category. The Ross Barnett Reservoir makes up most of the area. Refer to the tables for more details.

Fresh Water Marsh and Swamp

Areas classified in the fresh water marsh and swamp category total about 81.4 thousand acres with the swamp category accounting for about 95.6 percent of the total. Swamps are found in all hydrologic units and in most counties. Refer to the land use tables for more details.

Salt Water Marsh

These salt water marshes are found in the lower reaches of the Pearl River Basin. All 9.5 thousand acres are within Hancock County.

Other

The water resource of the basin contains 1.1 thousand acres identified as "other." These areas could not definitely be classified as lakes, reservoirs, or ponds but probably belong to one of these classes. Also, sixty-two acres were classed as bays and estuaries.

Cropland and Pasture Resources

The land cover classification of the Mississippi Data Base includes an entity for cropland and pasture. Therefore, the acres for this category--cropland and pasture--are identified by soils. Estimates of the amount of each of the two uses are included in this report.

The cropland and pasture areas total about 1.5 million acres. Table 3.9 and Table 3.10 list these totals for each of the hydrologic units and counties

Table 3.16. Stream systems, individual streams by drainage area groups, by hydrologic units and basin totals, Pearl River Basin, Subregion 0318, Mississippi part

Hydrologic unit and code	Number of individual streams by drainage area groups 1/						
	10-15 Sq. Mi.	15-20 Sq. Mi.	20-30 Sq. Mi.	30-50 Sq. Mi.	50-100 Sq. Mi.	100-400 Sq. Mi.	400+ Sq. Mi.
Upper Pearl River (3811)	10	5	10	5	3	5	1
Tuscolameta Creek (3812)	3	1	1	1	5	0	1
Yockanookany River (3813)	1	3	4	0	1	0	1
Pearl River above Ross Barnett Dam (3821)	4	3	1	1	2	1	1
Pearl River above Strong River (3822)	13	1	4	4	1	1	1
Strong River (3823)	2	3	3	6	2	0	1
Middle Pearl River (3830)	11	13	4	4	4	4	1
Lower Pearl River (3840)	17	15	5	4	0	5	1
Bogue Chitto (3850)	13	4	5	6	0	2	1
Mississippi Part Basin Total	74	48	37	31	18	18	9

Source: Soil Conservation Service, United States Department of Agriculture.

1/ Smaller tributaries are included in the total drainage area of the larger streams.

of the basin. Refer to these tables for the amount of cropland and pasture acres in each geographic area.

Soil resources being used for crop and pasture occur in varying amounts throughout the basin. Four of the hydrologic units each contain more than 218 thousand acres. Seven counties--Leake, Marion, Neshoba, Pearl River, Rankin, Scott, and Walthall--contain more than 100 thousand acres in the part of the county within the basin.

About two-thirds of the crop and pasture resources are on soils of MLRA 133A. Most of the remaining soils being used for crop and pasture are on soils of MLRA 134, with less than five percent of the total being on soils of MLRA 135 and 152A. Refer to Table 3.2.

Table 3.17 lists the estimates of cropland and pasture soil resource acres for the present and for the future without project conditions for the year of 2000. These estimates are by land capability soil subclass. Present cropland totals about 592.8 thousand acres for the present and about 599.4 thousand for the projected condition, year 2000. Pasture acreages decrease from about 903.1 thousand acres for the present to 896.5 thousand for the future.

Soils of Land Capability Classes 1 and 2 account for about 576.7 thousand acres or 38.5 percent of the total land being used for crops and pasture. Class 3 soils total about 387.1 thousand acres or 25.9 percent of the total. Class 4 cropland and pasture soils total about 180.6 thousand acres or 12.1 percent. The remaining crop and pasture acres are on soils with very severe limitations. These remaining acres are on Classes 5, 6, 7, and 8 with a few acres listed as unclassified.

In summary, about two-thirds of the crop and pasture acres are on the better soils of the basin--Classes 1, 2, and 3. If Class 4 soils (not considered one of the better soils) are added, then the percentage increases to about 76 percent of the total or about 1.1 million acres. Refer to Table 3.17 for a breakdown of cropland and pasture acres by land capability subclass. Note that Subclasses 2e and 3e account for a total of about 697.7 thousand acres or about 47 percent of the total.

Forest Areas

The forest areas of the Pearl River Basin are included in the land use tables in five classifications or as one group classification. The five classifications include deciduous, evergreen, mixed, other, and swamps. The five classifications are combined into a group for major land use tables with swamp being omitted for the prime and unique farmland tables.

According to the Mississippi Data Base classification (Tables 3.9 and 3.10) the basin contains about 3.1 million acres classified in the forest group. Evergreen forests total 1.2 million acres or 39.9 percent of the total forest area. Mixed areas of evergreen and deciduous forest are next in size with 1.2 million acres or 39.0 percent. Deciduous forest is the third largest category with 511.2 thousand acres or 16.3 percent. The remaining categories--other and swamp--total 72.9 thousand acres or 2.3 percent and 77.8 thousand acres or 2.5 percent, respectively.

Table 3.17. Cropland and pasture resources by land capability subclass, Pearl River Basin, Subregion 0318, Mississippi part, present and future without project (2000)

Land capability subclass	Cropland		Pasture		Basin Totals 1/
	Present	Future without	Present	Future without	
	Acres				
Unclassified	434	90	2,408	2,752	2,842
1	7,730	9,624	3,946	2,052	11,676
2e	110,651	121,027	243,719	233,343	354,370
2s	700	560	2,636	2,776	3,336
2w	84,700	107,123	122,572	100,149	207,272
3e	104,892	97,628	238,481	245,745	343,373
3s	--	--	741	741	741
3w	17,154	19,509	25,845	23,490	42,999
4e	52,343	49,827	107,049	109,565	159,392
4s	--	--	123	123	123
4w	7,950	7,501	13,179	13,628	21,129
5w	29,370	27,338	42,665	44,697	72,035
6e	103,812	90,288	61,820	75,344	165,632
6s	--	--	124	124	124
7e	72,060	67,440	37,229	41,849	109,289
7s	--	--	--	--	--
7w	1,014	1,483	469	--	1,483
8s	--	--	--	--	--
8w	--	--	124	124	124
TOTALS	592,810	599,438	903,130	896,502	1,495,940

Source: Mississippi Statewide Cooperative River Basin Study, Phase I, United States Department of Agriculture.

1/ The resource base was assumed to remain the same for present and future.

Agricultural Economy

General

The basin presents a diverse array of agricultural enterprises, including cash crops, cattle, hogs, poultry, and poultry processing. Wood and lumber products have historically been important in some parts of the basin. Poultry production is important in the Upper Pearl subarea; the production of wood and lumber products dominates the Lower Pearl subarea; and, beef cattle and dairy enterprises, on a small scale, are scattered throughout the region. The Upper and Reservoir subareas contain the largest acreage of cultivated cropland. In recent years, soybeans have replaced cotton as the dominant cash crop.

Crop Yields

Acreages of major crops by subareas are given in Table 3.18. These data illustrate the dramatic increase in soybean acreage and the decline in importance of cotton in the basin. The average yield in the basin for soybeans was estimated at 22.9 bushels per acre in 1976 (Mississippi Statewide Cooperative River Basin Study). Three-year average yields (1979-1981) based on estimates from the Crop and Livestock Reporting Service put the current yield at 21.2 bushels. The average cotton yield was estimated at 462 pounds per acre in 1976; the three-year average (1979-1981) was estimated at 588 pounds per acre. For corn, the average Statewide yield was estimated as 51.0 bushels, with the 1979-81 yields being 46.0 bushels per acre. Statewide yields for wheat were estimated at 27.4 bushels in 1976, and as 32.3 bushels for the years 1979-81. 1/

Income

Soybean production, using the three-year average yield figure, contributes over $79 million annually to agricultural income, while a comparable figure for cotton is about $32 million (based on current normalized prices). Farm income estimates for the basin are given in Table 3.19, along with livestock numbers. Livestock and poultry enterprises contribute significantly to total farm income, even though there has been a significant decline in cattle numbers since 1969 (Table 3.19).

Crop Distribution

The data in Tables 3.13 and 3.18 indicate substantial increases in cropland since 1975 in the basin. Harvested acres of major crops have increased by more than 62 percent, with soybeans the key crop; overall, harvested cropland increased over 173,000 acres between 1974 and 1978 (Table 3.13), an increase of more than 30 percent. These increases have occurred in harvested acres while total cropland has remained virtually unchanged.

1/ Represents data from District V, Mississippi Crop and Livestock Reporting Service. District V contains several of the larger cotton and soybean producing counties located in the basin.

Table 3.18. Harvested acres of major crops, selected years by areas and basin totals, Pearl River Basin, Mississippi

Area	Soybeans	Cotton	Corn 1/	Wheat
	Acres			
Upper Pearl River				
1965	1,900	62,700	77,100	220
1970	27,900	39,000	40,200	0
1975	50,200	23,920	29,900	1,500
1980	129,000	14,940	19,400	2,800
Reservoir				
1965	8,200	57,100	29,900	460
1970	70,600	46,900	17,900	300
1975	77,700	53,200	9,900	2,800
1980	171,700	56,300	7,600	3,800
Middle Pearl River				
1965	2,900	34,370	41,400	160
1970	25,000	16,400	26,600	850
1975	55,600	2,920	12,750	1,450
1980	89,700	1,130	11,800	3,600
Lower Pearl River				
1965	1,500	19,550	32,600	310
1970	26,400	4,075	15,900	450
1975	49,500	950	13,550	700
1980	89,000	0	20,200	5,700
Basin Total				
1965	14,500	173,720	181,000	1,150
1970	149,900	106,375	100,600	1,600
1975	233,000	80,990	66,100	6,450
1980	479,400	72,370	59,000	15,900

Source: Statistical Reporting Service.

1/ Harvested for all purposes.

Table 3.19. Selected agricultural income and livestock data by areas and years and basin totals, Pearl River Basin, Mississippi

Area and year	Farm income 1/		Livestock		
	County total	Average per farm	Cattle and calves	Milk cows	Hogs and pigs
	Thousand dollars	Dollars	Number	Number	Number
Upper Pearl River					
1969	72,867	7,645	236,663	21,599	32,517
1974	96,517	13,313	292,898	14,777	22,840
1978	175,692	31,096	201,641	13,054	26,966
Reservoir					
1969	48,669	11,844	176,837	3,823	30,027
1974	83,351	28,467	178,301	2,363	26,003
1978	109,379	44,901	120,843	1,777	30,903
Middle Pearl River					
1969	73,240	11,137	175,388	13,859	21,051
1974	106,297	22,243	214,502	11,997	17,267
1978	125,527	31,827	149,419	8,419	18,477
Lower Pearl River					
1969	27,408	5,666	155,730	25,490	18,502
1974	43,256	11,148	209,305	22,185	7,933
1978	62,249	18,722	155,197	23,074	14,727
Basin Totals					
1969	222,184	8,869	744,618	64,771	102,097
1974	329,421	17,488	895,006	51,322	74,043
1978	472,847	30,794	627,100	46,324	91,073

Source: U. S. Census of Agriculture

1/ Market value of agricultural products sold.

Forest Production

The Pearl River Basin's timber harvest increased substantially between 1966 and 1976. The 1976 harvest was 117 percent above the 1966 harvest. (See Table 3.20). Softwood sawtimber harvest in 1966 was 2.5 times that of hardwood. By 1977 this harvest ratio had increased to 3.5 times, and by 1981, the harvest ratio had increased to almost 6 times that of hardwood. In 1976 softwood sawtimber harvest of 581 million board feet almost equaled softwood sawtimber growth of 589 million board feet. Only the housing industry slowdown in 1981 has lessened the pressure on softwood sawtimber cutting.

During 1981 the timber severance tax collections for the Pearl Basin included $561,250 which was 24 percent of the total amount collected in the State. (See Table 3.21). The Pearl River Basin accounts for about 16 percent of the total area of the State. Ninety percent of these collections came from a combination of hardwood and pine logs and pulpwood. Highest ranking counties by collection were Rankin, Scott, Leake, Neshoba, Lawrence, Lincoln, and Winston. These counties are predominantly in the Central Forest Survey Region where there's a higher concentration of forest products manufacturing plants. (See Figures 2 and 4.4). The Central Region led the State in pine timber removals in the 1970's with volume harvested nearly doubling over the decade. 2/

Table 3.20. Pearl River Basin's timber harvest, by product, species group, and year

Year	Sawtimber		Pulpwood	
	Softwood	Hardwood	Softwood	Hardwood
	MBF	MBF	Cords	Cords
1966 1/	247.0	96.9	678.9	383.3
1976 1/	581.4	166.4	1,407.8	456.7
1981 2/	410.1	71.1	1,370.2	540.5

1/ Forest Survey in Mississippi.
2/ Based on severance tax collections which might be less than volumes actually cut.

2/ Mississippi Timber Removals: A ten-year (1970-1979) Presentation, February 1982.

Table 3.21. Pearl River Basin Timber Harvest, by Product, Species Group and County, 1981

County	Sawtimber 1/		Pulpwood 1/	
	Softwood	Hardwood	Softwood	Hardwood
	M board feet	M board feet	M cords	M cords
Attala	22.1	4.7	99.1	35.6
Choctaw	15.1	3.4	41.7	14.8
Copiah	32.9	8.1	80.0	49.5
Hancock	7.2	-	59.9	10.3
Hinds	4.7	4.0	22.6	23.9
Jefferson Davis	11.0	0.7	45.2	7.9
Kemper	26.7	6.0	64.5	31.2
Lamar	15.4	0.3	39.3	6.2
Lawrence	8.5	2.8	63.2	11.6
Leake	19.2	2.0	58.6	27.7
Lincoln	22.3	4.2	61.9	33.9
Madison	8.7	1.8	19.9	11.8
Marion	10.0	1.7	37.1	15.4
Neshoba	17.4	2.5	59.7	24.3
Newton	20.8	5.6	71.2	60.4
Pearl River	9.2	0.8	109.0	5.1
Pike	11.7	1.5	66.5	20.4
Rankin	39.4	4.2	93.9	31.9
Scott	27.1	3.9	81.2	30.2
Simpson	21.4	0.8	53.3	27.7
Smith	26.1	4.2	53.9	36.5
Walthall	6.3	1.8	16.7	8.7
Winston	26.9	6.1	71.8	15.5
All Counties	410.1	71.1	1,370.2	540.5

1/ Volumes are prorated values according to percent of county within basin.

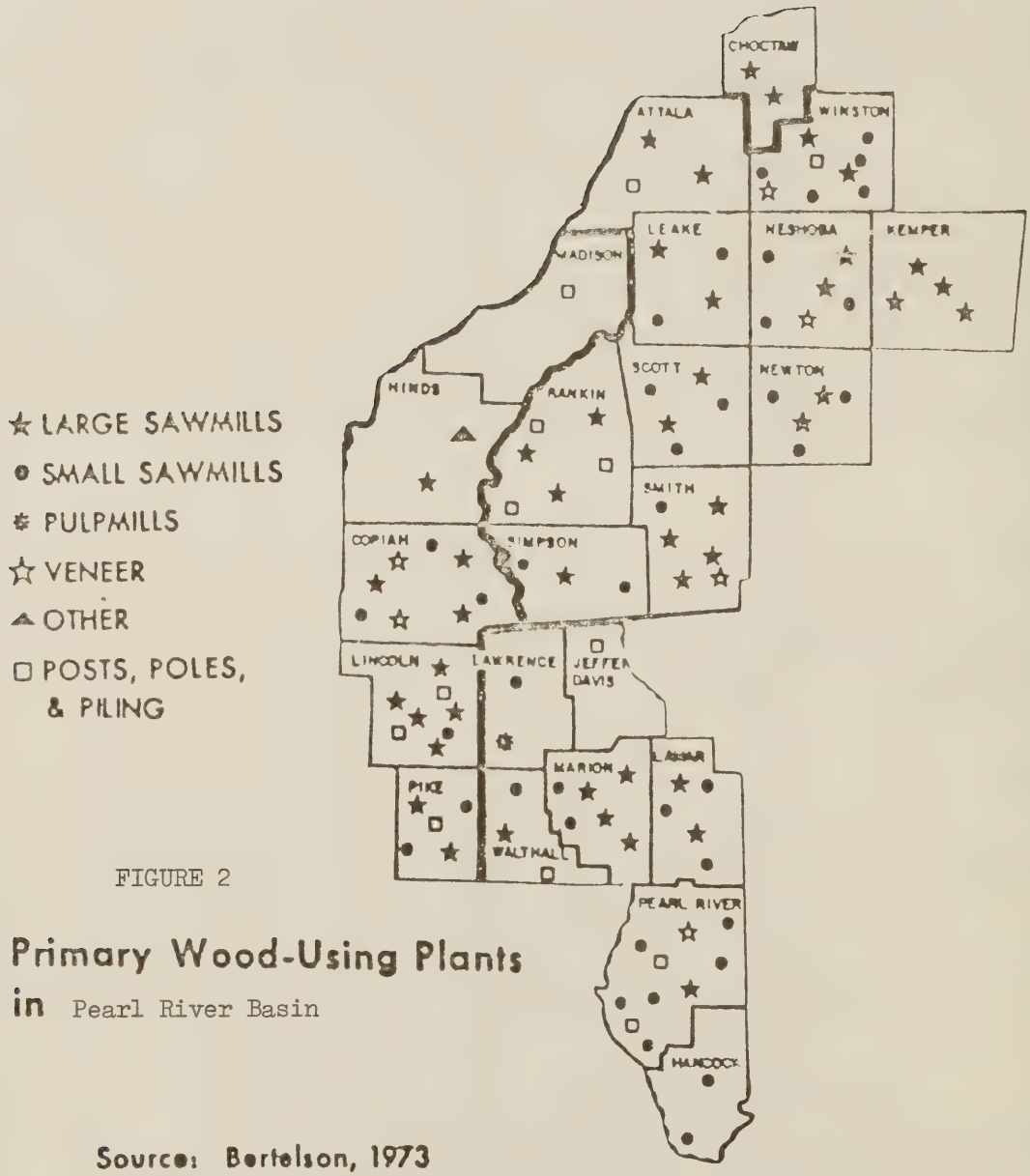


FIGURE 2

Primary Wood-Using Plants in Pearl River Basin

Source: Bertelson, 1973

CHAPTER IV

STATUS OF AGRICULTURAL RESOURCES

Land Use Trends

According to Census Reports, there has been a significant decline in land classified as farmland in the basin during the last two decades. As shown in Table 3.13, this decline amounts to over 2 million acres, a decrease of about 40 percent from the 1959 figure. Total cropland, on the other hand, has remained nearly constant over the same time period. The 1978 Census of Agriculture indicates that somewhat more of the cropland base is being used for pasture than during the 1960's. Acreage of cropland being used for pasture is subject to substantial variation from one reporting period to another, in response, apparently, to relative changes in the level of cattle prices.

Most of the reduction in the land-in-farms category has occurred in the "Woodland" and "Other Land" categories included in the Census Reports. Much of the land in these categories has evidently shifted from land classified as land in farms to forest land. Data from the Mississippi Automated Resource Information System developed for the statewide study show that over 62 percent of the basin area is classified as forest land, compared with only an estimated 43 percent at the time of the original Pearl Basin Study (1964).

Cropland and Pasture

Resource Problems

The crop and pasture acreages of the basin generally have problems that relate to erosion or flooding. Where these problems are severe, the future well-being of the area from an agricultural viewpoint is affected, since the land and soil resources can be expected to deteriorate. This deterioration causes reduced productivity, along with accompanying economic problems. The existence of the erosion and flooding problems is a concern of the basin residents. The need for improved resource management systems is generally recognized by agricultural interests.

Cropland and pasture resource problems are quantified for the present conditions in this chapter and for future without project conditions in the next chapter. The status of land treatment, flood damages, and sheet erosion problems are emphasized. Other kinds of erosion, gross erosion, and sediment yields are briefly discussed. Data are presented by hydrologic units and areas of the basin. Refer to Chapter II for a discussion of these geographic areas.

Status of Land Treatment

The status of land treatment for this report is described as treatment adequate and treatment needed. These are defined as follows:

Treatment adequate -- The level of conservation treatment on cropland or the vegetative cover condition on pasture is adequate to provide protection to the land resource base for sustained use as cropland or pasture (adequately protected).

Treatment Needed -- The needed conservation treatment system is lacking or incomplete on cropland, or the vegetative cover on pasture is nonexistent or deficient to provide sufficient protection to the land resource base for sustained use as cropland or pasture (not adequately protected).

The status of treatment on the acres used for crops and pasture are displayed in the tables and discussed in this chapter by hydrologic units, areas, and basin. Overall, for the present condition, about 490.4 thousand acres of cropland and 554.7 thousand acres of pasture need conservation practices in order to be considered adequately treated. This amounts to about 83 percent of the cropland and about 61 percent of the pasture acres. The remaining acres are adequately protected. Three hydrologic units--Upper Pearl River, Middle Pearl River, and Lower Pearl River--each have more than 74.0 thousand acres of cropland with treatment needs. All hydrologic units contain cropland and pasture acres with treatment needs, as well as some acres that are adequately protected. Refer to Table 4.1 for the acreages and percents for each hydrologic unit.

The status of land treatment by land capability subclass groups are displayed in Table 4.2 by the areas of the Pearl River Basin. These areas are discussed in Chapter II. Table 4.2 data contain only the parts of the counties within the basin. The subclass group 2e-3e-2s generally has the most cropland and pasture acres with treatment needs. About one-third of the cropland acres with treatment needs and about one-half of the pasture acres are in this subclass group. The subclass group 6e-7e has more cropland acres needing treatment than the 2e-3e-2s group but contains many acres of idle cropland with sufficient cover to prevent deterioration of the resource base. Critical acres are shown where the erosion rates are such that the resource base is being damaged. Refer to Table 4.2 for more details by areas and subclasses.

The status of treatment by areas is displayed by soil hazards in Table 4.3. Of the 490.4 thousand acres of cropland with treatment needs, 385.1 thousand acres or about 79 percent are on soils with an erosion hazard. The remaining 21 percent generally has a water hazard. The pasture ratio is about the same, with 78 percent on soils having erosion hazards and about 22 percent on water hazard soils. Refer to the table for the distribution by the various areas. The Upper Pearl River and the Lower Pearl River areas contain the most acres with treatment needs. Again, only the county parts within the basin are included.

Critical cropland areas for each of the hydrologic units and for the basin are displayed in Table 4.4. These totals are by land capability subclass for soils having an erosion hazard. A total of 62.1 thousand acres are being eroded at rates that harm the resource base. About 69.3 percent of these acres are on subclass 3e, about 23.5 percent on subclass 4e, and the remaining 7.2 percent on 6e and 7e land capability subclasses. The Upper Pearl River hydrologic

Table 4.1. Status of land treatment, cropland and pasture by hydrologic units and basin totals, acres and percents, Pearl River Basin, Mississippi part, present 1976

Hydrologic Unit	Unit	Cropland		Pasture	
		Treatment adequate	Treatment needed	Treatment adequate	Treatment needed
Name and Code					
Upper Pearl River (3811)	Acres	15,530	89,794	60,921	101,446
	Percent	14.74	85.26	37.52	62.48
Tuscolameta Creek (3812)	Acres	5,089	41,164	24,341	52,226
	Percent	11.00	89.00	31.79	68.21
Yockanookany River (3813)	Acres	5,061	27,594	16,179	29,381
	Percent	15.50	84.50	35.51	64.49
Pearl River above Ross Barnett Dam (3821)	Acres	7,742	26,312	23,166	31,434
	Percent	22.73	77.27	42.43	57.57
Pearl River above Strong River (3822)	Acres	11,612	37,305	37,205	40,465
	Percent	23.74	76.26	47.90	52.10
Strong River (3823)	Acres	4,591	35,591	20,341	36,718
	Percent	11.43	88.57	35.65	64.35
Middle Pearl River (3830)	Acres	19,499	74,161	57,670	85,719
	Percent	20.82	79.18	40.22	59.78
Lower Pearl River (3840)	Acres	16,782	98,649	54,659	88,705
	Percent	14.54	85.46	38.13	61.87
Bogue Chitto (3850)	Acres	16,489	59,845	53,985	88,569
	Percent	21.60	78.40	37.87	62.13
Basin Total	Acres	102,395	490,415	348,467	554,663
	Percent	17.27	82.73	38.58	61.42

Source: Soil Conservation Service, United States Department of Agriculture.

Table 4.2. Status of land treatment, cropland and pasture, by land capability subclass, by areas and basin totals, Pearl River Basin, Mississippi, present

Item	Land capability subclass								
	1	2e, 3e 2s	2w, 3w	4w, 5w	3s, 4e	6e, 7e	1/ Other	Total
	Acres							
Upper Pearl River Area (counties)								
Cropland								
Treatment adequate	0	11,912	13,009	760	1,928	0	0	27,609
Treatment needed	0	44,259	28,158	15,231	22,116	63,149	0	172,913
Critical 2/	0	16,928	0	0	6,330	746	0	24,004
Pasture								
Treatment adequate	0	47,110	31,988	6,426	21,639	4,552	0	111,715
Treatment needed	0	66,430	34,713	20,397	46,801	34,048	124	202,513
Reservoir Area (counties)								
Cropland								
Treatment adequate	0	9,174	6,456	551	226	0	0	16,407
Treatment needed	0	25,906	10,540	2,370	3,558	15,047	124	57,545
Critical 2/	0	11,123	0	0	2,471	800	0	14,394
Pasture								
Treatment adequate	0	39,351	8,961	1,034	1,355	1,984	0	52,685
Treatment needed	0	40,913	4,997	2,470	2,520	10,397	248	61,545
Middle Pearl River Area (counties)								
Cropland								
Treatment adequate	5,075	13,600	7,859	536	360	0	93	27,523
Treatment needed	1,234	39,352	15,336	7,886	8,569	37,341	217	109,935
Critical 2/	0	8,269	0	0	3,074	1,916	0	13,259
Pasture								
Treatment adequate	3,463	59,383	17,893	3,055	4,726	2,590	110	91,220
Treatment needed	483	64,966	17,661	14,161	13,527	25,323	1,188	137,309
Lower Pearl River Area (counties)								
Cropland								
Treatment adequate	1,298	21,156	7,325	40	1,037	0	0	30,856
Treatment needed	123	50,890	13,171	9,947	14,549	60,327	1,015	150,022
Critical 2/	0	6,681	0	0	2,703	1,036	0	10,420
Pasture								
Treatment adequate	0	70,629	14,991	1,338	3,586	2,303	0	92,847
Treatment needed	0	96,048	17,213	7,083	13,636	17,860	1,456	153,296
Pearl River Basin Totals								
Cropland								
Treatment adequate	6,373	55,842	34,649	1,887	3,551	0	93	102,395
Treatment needed	1,357	160,407	67,205	35,434	48,792	175,864	1,356	490,415
Critical 2/	0	43,001	0	0	14,578	4,498	0	62,077
Pasture								
Treatment adequate	3,463	216,473	73,833	11,853	31,306	11,429	110	348,467
Treatment needed	483	268,357	74,584	44,111	76,484	87,628	3,016	554,663

Source: Soil Conservation Service, United States Department of Agriculture.

1/ Other includes all land capability subclasses not previously shown--"s" and "w" soils plus areas without soil classifications.

2/ Critical areas are included in the treatment needed acres. These critical areas are being used to grow crops. Other acres that would be classified as "critical", if growing crops, are idle and have cover.

Table 4.3. Status of land treatment, cropland and pasture, by soil hazards by county areas and basin totals, Pearl River Basin, Mississippi, present, 1975

County and land capability subclass	Hazard	Cropland: Treatment adequate	Cropland: Treatment needed	Pasture: Treatment adequate	Pasture: Treatment needed
		Acres			
Upper Pearl River Area counties					
"e" soils	Erosion 1/	13,840	129,524	73,301	147,279
"w" soils	Water	13,769	43,389	38,414	55,110
Other soils	2/	0	0	0	124
Area total - (acres)	xxxxx	27,609	172,913	111,715	202,513
(percent)	xxxxx	13.77	86.23	35.55	64.45
Reservoir Area counties					
"e" soils	Erosion 1/	9,400	44,511	42,690	53,954
"w" soils	Water	7,007	12,910	9,995	7,467
Other soils	2/	0	124	0	124
Area total - (acres)	xxxxx	16,407	57,545	52,685	61,545
(percent)	xxxxx	22.19	77.81	46.12	53.88
Middle Pearl River Area counties					
"e" soils	Erosion 1/	13,960	85,262	66,699	103,816
"w" soils	Water	8,395	23,222	20,948	31,822
Other soils	2/	5,168	1,451	3,573	1,671
Area total - (acres)	xxxxx	27,523	109,935	91,220	137,309
(percent)	xxxxx	20.02	79.98	39.92	60.08
Lower Pearl River Area counties					
"e" soils	Erosion 1/	22,193	125,766	76,517	127,668
"w" soils	Water	7,365	24,133	16,330	24,764
Other soils	2/	1,298	123	0	863
Area total - (acres)	xxxxx	30,856	150,022	92,847	153,296
(percent)	xxxxx	17.06	82.94	37.72	62.28
Basin Totals					
"e" soils	Erosion 1/	59,393	385,063	259,206	432,712
"w" soils	Water	36,536	103,653	85,687	119,168
Other soils	2/	6,467	1,698	3,573	2,784
Area total - (acres)	xxxxx	102,395	490,415	348,467	554,663
(percent)	xxxxx	17.27	82.73	38.58	61.42

Source: Soil Conservation Service, United States Department of Agriculture.

1/ Also includes "s" soils (properties) that make up a very small part of the total.

2/ Includes Class 1 soils and areas without land capability classification.

Table 4.4. Critical erosion of cropland acreage by erosion hazard subclass by hydrologic unit and basin total, Subregion 0318, Pearl River Basin, Mississippi part, present, 1976

Hydrologic unit name and number	Cropland with critical erosion			
	3e	4e	6e, 7e	Total
	Acres	Acres	Acres	Acres
Upper Pearl River (3811)	8,068	3,894	100	12,062
Tuscolameta Creek (3812)	3,390	933	250	4,573
Yockanookany River (3813)	3,981	860	296	5,137
Pearl River above Ross Barnett Dam (3821)	4,647	540	173	5,360
Pearl River above Strong River (3822)	7,043	2,075	327	9,445
Strong River (3823)	2,653	1,150	800	4,603
Middle Pearl River (3830)	5,257	1,865	1,416	8,538
Lower Pearl River (3840)	2,106	1,510	600	4,216
Bogue Chitto (3850)	5,856	1,751	536	8,143
Basin Total	43,001	14,578	4,498	62,077

Source: Soil Conservation Service, United States Department of Agriculture

unit contains the most critical cropland acres, about 12.1 thousand acres or about 19.4 percent of the basin total. Refer to the table for more details on the distribution by these hydrologic units.

Flooding

General

Flooding is one of the major problems of the Pearl River Basin. About 1.3 million acres or 25.1 percent of the study area are subject to flooding. The severity of the problem depends on the present use of the flood plain and the frequency and stage of the flooding.

Flooding occurs in the flood plain of the principal streams and within the upstream watersheds. The principal stream flood plains are generally defined as those areas below the point where the drainage area exceeds 400 square miles. Therefore, upstream watershed flood plains have drainage areas of less than 400 square miles. The flooding characteristics of floods within these two areas differ. The floods occur less often along the principal streams with the duration of the flooding being longer, lasting several days to weeks. Upstream flooding, while occurring more often, is of short duration, a few hours to several days, depending on the location within the watershed.

Areas Subject to Flooding

The flood plain estimates for the study area are listed by principal stream and upstream watershed reaches along with a total area subject to flooding for each hydrologic unit (Table 4.5). With 1.3 million acres subject to flooding within the study area, the table lists 918.0 thousand of these acres as being within the upstream watersheds and 334.7 thousand along the principal stream reaches. Therefore, more than 73 percent of the total area subject to flooding occurs within the upstream watershed reaches.

The Upper Pearl River hydrologic unit, with 22.6 percent of the total area subject to flooding, has the most acres of flood plain. The Lower Pearl River hydrologic unit is second, with 220.3 thousand acres or 17.6 percent of the total flood plain. Refer to the table for more details.

Flooding within the individual watersheds that was investigated during the study is discussed in the following chapter and Appendix A.

Flood Plain Land Use

Table 4.6 displays the flood plain land use by four categories for each of the hydrologic units and for the basin. Forest is the major use in the flood plain, with 69.6 percent of the total; agriculture is next, with 24.5 percent. Urban and built-up and other are the remaining uses, with 5.9 percent of the total. Agricultural uses vary by hydrologic units, accounting for 29.9 percent of the total in hydrologic unit 3811 (Upper Pearl River), the highest, and 14.6 percent of the total in hydrologic unit 3821 (Pearl River above Ross Barnett Reservoir), the lowest. See the table for additional details.

Table 4.5. Flood plain acres by principal stream and upstream watershed reaches by hydrologic units, Pearl River Basin, Mississippi part, present (1976)

Hydrologic unit name and code	Flood plain reaches		
	Principal stream	Upstream watershed	Total
	Acres	Acres	Acres
Pearl River (0318)[1/]			
Cataloging Unit 03180001[1/]			
Upper Pearl River (3811)[2/]	40,308	242,403	282,711
Tuscolameta Creek (3812)	11,322	92,522	103,844
Yockanookany River (3813)	11,483	74,273	85,756
Cataloging Unit 03180002			
Pearl River above Ross Barnett Dam (3821)	36,107	50,248	86,355
Pearl River above Strong River (3822)	57,265	50,924	108,189
Strong River (3823)	12,427	78,980	91,407
Cataloging Unit 03180003			
Middle Pearl River (3830)	70,412	95,922	166,334
Cataloging Unit 03180004, Mississippi part			
Lower Pearl River (3840)	83,698	136,579	220,277
Cataloging Unit 03180005, Mississippi part			
Bogue Chitto (3850)	11,656	96,129	107,785
Basin Totals	334,678	917,980	1,252,658

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.
2/ Mississippi Data Base (MARIS) hydrologic unit code.

Table 4.6. Flood plain land use distribution on land subject to flooding by hydrologic units and basin totals, Pearl River Basin, Mississippi part, present, 1976

Hydrologic unit code and name	Agri-cultural	Forest	Urban and built-up	Other
	Percents			
Pearl River (0318)[1]				
Cataloging Unit 03180001[1]				
Upper Pearl River (3811)[2]	29.85	66.14	2.35	1.66
Tuscolameta Creek (3812)	27.10	68.91	1.25	2.74
Yockanookany River (3813)	32.18	63.31	3.34	1.17
Cataloging Unit 03180002				
Pearl River above Ross Barnett Dam (3821)	14.63	81.00	1.51	2.86
Pearl River above Strong River (3822)	22.01	65.88	8.47	3.84
Strong River (3823)	25.46	70.51	2.28	1.75
Cataloging Unit 03180003				
Middle Pearl River (3830)	24.60	71.21	2.22	1.97
Cataloging Unit 03180004, Mississippi part				
Lower Pearl River (3840)	16.10	73.80	2.23	7.87
Cataloging Unit 03180005, Mississippi part				
Bogue Chitto (3850)	28.44	67.09	2.58	1.89
Basin Totals	24.50	69.58	2.77	3.15

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.
2/ Mississippi Data Base (MARIS) hydrologic unit code.

Tables 4.7 and 4.8 display the crop and pasture distribution for the flood plains of the various hydrologic units and for the basin. The data are shown as a part of the total flood plain and a part of the cropland and pasture use in the flood plain. Table 4.7 shows that cropland accounts for 9.8 percent of the total flood plain, and pasture for 14.6 percent. Soybeans is the largest single crop, with 2.8 percent of the total flood plain. However, miscellaneous crops and idle account for 5.0 percent. Refer to the table for the crop and pasture distributions for the various hydrologic units.

Table 4.8 displays the crop and pasture percentages for the agricultural land in the flood plain. Overall, pasture accounts for 59.7 percent of the total area being used for crops and pasture within the flood plain. Cropland use totals 40.3 percent. Soybeans is the the largest single crop, accounting for 11.4 percent of the total crop and pasture use area. Again, however, miscellaneous crops and idle acres total 20.5 percent. Improved pasture is the largest single use in this part of the flood plain. Refer to the tables for more details and for use for the hydrologic units.

Flood Damages

Average annual flood damages were estimated for all hydrologic units of the study area and for the total study area. Two major categories of damages are used in the displays. The data generally are from the results of the Phase I part of the Mississippi Statewide Cooperative River Basin Study. Additional flood damages by the individual watersheds evaluated during the Pearl River Basin Study are discussed later in the next chapter.

Table 4.9 lists the flood damages by hydrologic unit and for the study area or the Mississippi part of the Pearl River Basin. Damages on an average annual basis total $7.7 million to crops and pasture, and $926.0 thousand to agricultural improvements. Nonagricultural average annual damages total $5.7 million. Total average annual flood damages amount to $14.3 million. Refer to Table 4.9 for more details and damages for each hydrologic unit.

Sheet and Rill Erosion

General

Sheet and rill erosion occurs throughout the study area from the various land uses. This kind of erosion from whatever source is a problem if the level of erosion is unacceptable. Excessive sheet erosion usually means a loss of fertile topsoil and applied nutrients that are irretrievably lost and cannot be replaced.

As generally is true for most of the State, the soils of the study area are subject to excessive sheet and rill erosion in the absence of proper cover or treatment. Even though some soils are more susceptible to erosion than others, sloping soils throughout the basin are being used in such a manner that soil losses are a major problem. In many cases the resource is deteriorating.

Table 4.7. Cropland and pasture distribution on the land subject to flooding by hydrologic units, Pearl River Basin, Mississippi part, present (1976)

Hydrologic unit name and code	As a part of the total floodplain									
	Cropland						Pasture			Cropland and pasture totals
	Cotton	Corn	Wheat	Soybeans	Miscellaneous	TOTAL	Improved	Unimproved	TOTAL	
Pearl River (0318) 1/	Percent									
Cataloging Unit 03180001 1/										
Upper Pearl River (3811) 2/	1.55	1.35	.28	2.30	5.42	10.90	15.10	3.70	18.80	29.70
Tuscolameta Creek (3812)	.82	.82	0	1.72	7.13	10.49	11.01	5.42	16.43	26.92
Yockanookany River (3813)	3.35	1.59	0	3.80	4.54	13.28	14.30	4.45	18.75	32.03
Cataloging Unit 03180002										
Pearl River above Ross Barnett Dam (3821)	1.37	.37	0	2.45	2.85	7.04	4.90	2.69	7.59	14.63
Pearl River above Strong River (3822)	2.96	.56	.20	4.45	2.73	10.90	9.36	1.69	11.05	21.95
Strong River (3823)	1.25	.60	.10	4.18	4.76	10.89	10.48	3.90	14.38	25.27
Cataloging Unit 03180003										
Middle Pearl River (3830)	.11	.63	.05	2.99	5.46	9.24	9.56	5.80	15.36	24.60
Cataloging Unit 03180004, Mississippi part										
Lower Pearl River (3840)	.03	.35	.03	1.93	5.27	7.61	5.44	3.05	8.49	16.10
Cataloging Unit 03180005, Mississippi part										
Bogue Chitto (3850)	.22	.96	0	3.01	5.22	9.41	14.50	4.53	19.03	28.44
Basin Totals	1.13	.82	.10	2.78	5.01	9.84	10.68	3.90	14.58	24.42

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.
2/ Mississippi Data Base (MARIS) hydrologic unit code.

Table 4.8. Cropland and pasture distribution on the land subject to flooding by hydrologic units, Pearl River Basin, Mississippi part, present (1976)

Hydrologic unit name and code	As a part of the cropland and pasture use in the floodplain									
	Cropland						Pasture			Cropland and pasture totals
	Cotton	Corn	Wheat	Soy-beans	Miscel-laneous	TOTAL	Im-proved	Unim-proved	TOTAL	
Pearl River (0318) 1/	Percent									
Cataloging Unit 03180001 1/										
Upper Pearl River (3811) 2/	5.22	4.55	.94	7.74	18.25	36.70	50.84	12.46	63.30	100.00
Tuscolameta Creek (3812)	3.04	3.01	0	6.38	26.53	38.96	40.88	20.16	61.04	100.00
Yockanookany River (3813)	10.45	4.96	0	11.86	14.20	41.47	44.62	13.91	58.53	100.00
Cataloging Unit 03180002										
Pearl River above Ross Barnett Dam (3821)	9.42	2.58	0	16.74	19.39	48.13	33.46	18.41	51.87	100.00
Pearl River above Strong River (3822)	13.47	2.54	.93	20.27	12.44	49.65	42.63	7.72	50.35	100.00
Strong River (3823)	4.93	2.34	.39	16.55	18.89	43.10	41.47	15.43	56.90	100.00
Cataloging Unit 03180003										
Middle Pearl River (3830)	.45	2.58	.21	12.13	22.19	37.56	38.86	23.58	62.44	100.00
Cataloging Unit 03180004, Mississippi part										
Lower Pearl River (3840)	.21	2.12	.13	12.01	32.79	47.26	33.85	18.89	52.74	100.00
Cataloging Unit 03180005, Mississippi part										
Bogue Chitto (3850)	.77	3.37	0	10.59	18.36	33.09	50.96	15.95	66.91	100.00
Basin Totals	4.62	3.38	.40	11.36	20.51	40.27	43.75	15.98	59.73	100.00

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.
2/ Mississippi Data Base (MARIS) hydrologic unit code.

Table 4.9. Flood damages by agricultural and non-agricultural damages by hydrologic unit and basin total, Pearl River Basin Study, Mississippi part, present (1976)

Hydrologic unit code and name	Flood damages (average annual)					
	Agricultural		Non-agricultural			
	Crops and pasture	Improvements	Roads, bridges, and railroads	Urban and built-up	Other	Total damages
	Thousand dollars					
Pearl River (0318)[1]						
Cataloging Unit 03180001[1]						
Upper Pearl River (3811)[2]	2,214	266	438	280	356	3,554
Tuscolameta Creek (3812)	632	76	161	51	102	1,022
Yockanookany River (3813)	806	97	154	84	127	1,268
Cataloging Unit 03180002						
Pearl River above Ross Barnett Dam (3821)	346	42	155	42	65	650
Pearl River above Strong River (3822)	759	91	227	829	212	2,118
Strong River (3823)	640	77	192	65	108	1,082
Cataloging Unit 03180003						
Middle Pearl River (3830)	985	118	349	131	177	1,760
Cataloging Unit 03180004, Mississippi part						
Lower Pearl River (3840)	580	70	341	271	141	1,403
Cataloging Unit 03180005, Mississippi part						
Bogue Chitto (3850)	742	89	350	148	148	1,477
Basin Totals	7,704	926	2,367	1,901	1,436	14,334

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.

2/ Mississippi Data Base (MARIS) hydrologic unit code.

Sheet and rill erosion in the basin totals 11.0 million tons on an average annual basis. A big part of this, 6.7 million tons or 60.5 percent of the total, comes from cropland. Forest contributes 2.3 million tons or 20.7 percent, while pasture accounts for 2.1 million tons or 18.7 percent of the total. The remaining 0.1 percent is from other agricultural uses, such as orchards and feeding operations.

This total of 11.0 million tons of annual sheet erosion is equivalent to 1.4 thousand tons per square mile or about 2.2 tons per acre from the entire study area. The total of 6.7 million tons from cropland represents an average of 11.2 tons from each acre. Many acres are losing soil at a rate well above this figure.

Sheet erosion by major land uses and gross erosion by kinds of erosion are displayed in the following tables. Table 4.10 lists estimates of average annual sheet erosion by basin areas for the major land uses. Table 4.11 lists the total gross erosion estimates for each of the areas by various sources. Tables 4.12 and 4.13 present data by hydrologic units. These tables are discussed below.

Cropland

Sheet erosion rates from cropland vary throughout the basin, depending primarily on the status of the resource management systems on the land. The type and quality of cover are the main factors that determine the treatment level. The total average annual sheet erosion from cropland is displayed in Tables 4.10 by areas and 4.12 by hydrologic units. Table 4.14 provides data on soil loss from cropland and pasture by land capability subclass groups and treatment status.

Average annual sheet erosion from cropland averages 11.2 tons per acre for the basin. This average from cropland varies by areas, with a low of 9.1 tons per acre for the Lower Pearl River Area to a high of 16.9 tons per acre for the Reservoir Area. The Upper Pearl River Area averages 10.3 tons per acre and the Middle Pearl River Area, 12.5 tons per acre. The high rate for the Reservoir Area is due to the large part (19.5 percent) of total cropland classed as critical. The critical cropland percent for the basin is 10.5. It is 5.8 percent for the Lower Pearl River Area, 9.6 percent for the Middle Pearl River Area, and 12.0 percent for the Upper Pearl River Area. Critical cropland totals are included in Table 4.2.

The average annual sheet erosion rates are generally less than 4 tons per acre on cropland with adequate protection. The rates vary for the untreated and partially treated acres usually by the kind of soil and slope. These rates may exceed 100 tons per acre on very steep slopes. Generally, the rates are more than 15 tons per acre and below 30 tons per acre on the less steep slopes.

Table 4.12 provides sheet erosion data by hydrologic units. The average annual sheet erosion rates on cropland, as previously stated are less than 4.0 tons per acre on adequately protected soils. For the treatment needed area the average for the basin from each acre of croplands is 12.9 tons per acre. This varies from a low of 8.3 tons per acre for the Lower Pearl River hydrologic unit to a high of 20.7 tons per acre for the Pearl River above

Table 4.10. Estimated average annual sheet erosion by area, Pearl River Basin, Subregion 0318, Mississippi part, 1975 (present)

Area	Drainage area	Source of sheet erosion				
		Cropland	Pasture	Forest 1/	Other	Total
	Square miles	Thousand tons				
Upper Pearl River Area	2,752.4	2,055.0	738.7	594.4	7.5	3,395.6
(Average tons per acre)		10.3	2.4	0.5	xxx	1.9
Reservoir Area	1,134.5	1,246.9	256.1	276.7	3.2	1,782.9
(Average tons per acre)		16.9	2.2	0.7	xxx	2.5
Middle Pearl River Area	1,989.9	1,714.6	655.4	1,116.0	1.6	3,487.6
(Average tons per acre)		12.5	2.9	1.3	xxx	2.7
Lower Pearl River Area	1,915.1	1,651.4	415.3	298.2	0.3	2,365.2
(Average tons per acre)		9.1	1.7	0.4	xxx	1.9
TOTAL	7,791.9	6,667.9	2,065.5	2,285.3	12.6	11,031.3
(Average tons per acre)		11.2	2.3	0.7	xxx	2.2

Source: Soil Conservation Service, United States Department of Agriculture.

1/ Includes erosion on disturbed forest land (logging, site preparation, etc.) and natural, undisturbed forest land.

Table 4.11. Estimated average annual gross erosion by area, Pearl River Basin, Subregion 0318, Mississippi part, 1975 (present)

Area	Drainage area	Source of erosion							
		Sheet	Gully	Stream-bank	Road-bank	Surface mines	Urban	Gross erosion	
	Square miles	Thousand tons							Tons per square mile
Upper Pearl River Area	2,752.4	3,395.6	537.2	1,434.4	233.2	81.1	0	5,681.5	2,064.2
Reservoir Area	1,134.5	1,782.9	356.4	337.3	38.7	206.5	14.7	2,736.5	2,412.1
Middle Pearl River Area	1,989.9	3.487.6	317.7	1,798.4	150.4	184.3	0	5,938.4	2,984.3
Lower Pearl River Area	1,915.1	2,365.2	222.5	644.5	147.6	93.0	4.4	3,477.2	1,815.7
TOTAL	7,791.9	11,031.3	1,433.8	4,214.6	569.9	564.9	19.1	17,833.6	2,288.7

Source: Soil Conservation Service, United States Department of Agriculture.

Table 4.12. Estimated average annual sheet erosion by hydrologic unit, Pearl River Basin, Subregion 0318, Mississippi part, 1975 (present)

Hydrologic unit [1]		Drainage area	Source of sheet erosion				
			Cropland	Pasture	Forest	Other	TOTAL
Code	Name	Square miles	Thousand tons				
3811	Upper Pearl River	1,409.4	961.4	384.8	223.4	3.2	1,572.8
3812	Tuscolameta Creek	576.2	437.1	134.8	55.4	2.3	629.6
3813	Yockanookany River	478.8	446.3	169.0	243.2	0.3	858.8
3821	Pearl River above Ross Barnett Dam	588.6	528.7	85.2	65.9	2.2	682.0
3822	Pearl River above Strong River	704.7	809.8	183.0	220.7	0.2	1,213.7
3823	Strong River	687.8	454.5	163.1	358.7	4.0	980.3
3830	Middle Pearl River	1,221.8	1,059.2	441.7	651.8	0.1	2,152.8
3840	Lower Pearl River	1,283.3	871.8	249.2	129.3	0.3	1,250.6
3850	Bogue Chitto	841.3	1,099.1	254.7	336.9	0	1,690.7
0318	Pearl River Basin Total	7,791.9	6,667.9	2,065.5	2,285.3	12.6	11,031.3
	Tons per Acre		11.2	2.3	0.7	xxxx	2.2

1/ Mississippi part only.

Table 4.13. Estimated average annual erosion and sediment yield by hydrologic unit, Pearl River Basin, Subregion 0318, Mississippi part, 1975 (present)

Hydrologic unit 1/		Drainage area	Type of erosion							Sediment 2/ yield
Code	Name	Square miles	Sheet	Gully	Streambank	Roadbank	Surface mines	Urban	Gross erosion	
			Thousand tons							
3811	Upper Pearl River	1,409.4	1,572.8	280.6	1,098.5	148.6	55.4	0	3,155.9	631.2
3812	Tuscolameta Creek	576.2	629.6	130.3	188.3	49.3	4.3	0	1,001.8	220.4
3813	Yockanookany River	478.8	858.8	72.1	96.9	19.8	6.6	0	1,054.2	231.9
3821	Pearl River above Ross Barnett Dam	588.6	682.0	148.1	106.3	20.7	14.6	4.2	975.9	204.9 3/
3822	Pearl River above Strong River	704.7	1,213.7	213.3	277.9	28.8	255.7	10.5	1,999.9	420.0
3823	Strong River	687.8	980.3	188.7	336.7	39.0	30.6	0	1,575.3	330.8
3830	Middle Pearl River	1,221.8	2,152.8	161.2	1,181.7	113.8	112.9	0	3,722.4	744.5
3840	Lower Pearl River	1,283.3	1,250.6	109.1	347.1	106.5	40.9	4.4	1,858.6	371.7
3850	Bogue Chitto	841.3	1,690.7	130.4	581.2	43.4	43.9	0	2,489.6	522.8
0318	Pearl River Basin Total	7,791.9	11,031.3	1,433.8	4,214.6	569.9	564.9	19.1	17,833.6	xxxxx

1/ Mississippi part only.
2/ Total is for hydrologic unit only.
3/ Includes 180.3 trapped by reservoir.

Table 4.14. Estimated average annual soil loss on cropland and pasture by land treatment status by soil subclass groupings, Pearl River Basin, Subregion 0318, Mississippi part, 1975 (present)

Item	Item	Land capability subclass groups: 2e, 3e	1/ 4e, 6e, 7e	2/ Other	TOTALS
Cropland					
Treatment adequate	Thousand tons	180.8	6.6	133.1	320.5
	Tons per acre	3.40	3.68	3.22	xxxxx
Treatment needed	Thousand tons	4,153.5	1,621.9	572.0	6,347.4
	Tons per acre	27.80	78.70	6.43	xxxxx
Totals	Thousand tons	4,334.3	1,628.5	705.1	6,667.9
	Percent of total	65.0	24.4	10.6	100.0
Pasture					
Treatment adequate	Thousand tons	57.2	27.6	5.1	89.9
	Tons per acre	0.29	0.67	0.11	xxxx
Treatment needed	Thousand tons	529.6	1,425.3	20.7	1,975.6
	Tons per acre	2.26	10.30	0.21	xxxx
Totals	Thousand tons	586.8	1,452.9	25.8	2,065.5
	Percent of total	28.4	70.3	1.3	100.0

Source: Soil Conservation Service.

1/ Rates exclude idle cropland and miscellaneous crops.
2/ Includes all class 1, all subclass "w" and "s" and areas without soil classifications.

Strong River hydrologic unit. Refer to Table 4.12 for the sheet erosion totals for each hydrologic unit.

Pasture

Pasture sheet erosion rates vary for the Pearl River Basin. Total average annual sheet erosion from pasture is about 2.1 million tons or 2.3 tons per acre. These rates range from 1.7 thousand tons for the Lower Pearl Area to 2.9 thousand tons for the Middle Pearl Area. Total sheet erosion from pasture by areas and hydrologic units are included in Tables 4.10 and 4.12. Table 4.14 includes soil loss on pasture by land capability subclass groups and treatment status. Sheet erosion rates on very steep pasture acres exceed 10 tons per acre (Table 4.14).

Forest

Forest erosion is included in Tables 4.10 and 4.12 by areas and by hydrologic units. Totals and average annual rates are shown. Overall for the basin, average annual sheet erosion totals 2.3 million tons or 0.7 tons per acre. These data include erosion on disturbed forest land and on natural, undisturbed forest land. Rates range from 0.4 tons per acre for the Lower Pearl River Area to 1.3 tons per acre for the Middle Pearl River Area. Refer to the tables for more details.

Other

The totals for sheet erosion from other sources included in Tables 4.10 and 4.12 are extremely small. This category includes orchards, feeding operations, and other agricultural uses. Erosion on these areas was not identified as a problem under the "Scope of the Study." Localized problem areas are likely to exist where there is poor management.

Gross Erosion

The total gross erosion on an area is the sum of erosion from all sources. Six sources or kinds of erosion were identified for the basin. These are sheet, gully, streambank, roadbank, surface mines, and urban. The total gross erosion for the basin totals 17.8 million tons or an average of about 2.3 thousand tons per square mile of drainage area. This gross erosion is equivalent to 3.6 tons from each acre of the basin.

Sheet erosion is the largest contributor with 61.9 percent of the total. Streambanks contribute 23.6 percent of the total and gullies 8.0 percent. Roadbanks and surface mines each contribute about 3.2 percent of the total. Urban areas contribute about one-tenth of one percent of the total gross erosion.

Gross erosion as an average for any area may be expressed in tons per square mile of drainage area. This average varies for the basin from 1.8 to 3.0 thousand tons per square mile with the Middle Pearl River Area being the highest and the Lower Pearl River Area the lowest. As previously stated, these areas are county groups.

Gross erosion averages in tons per square mile of drainage area vary also for the nine hydrologic units. The range is from 1.4 thousand tons per square mile for the Lower Pearl River hydrologic unit (3840) to 3.0 thousand tons per square mile for the Middle Pearl River hydrologic unit (3830). Three of the hydrologic units had averages of less than 2.0 thousand tons per square mile--3812, 3821, and 3840. The three hydrologic units with the highest rates, all exceeding 2.8 thousand tons per square mile, are 3822, 3830, and 3850. A rate of 3.0 thousand tons per square mile is equivalent to about 4.7 tons per acre. Refer to the tables for details on amounts of erosion by type for the various geographic areas.

Sediment Yield

Sediment yield is that part of gross erosion that is transported past a given point. Sediment yields in total tons are shown in Table 4.13 for the various hydrologic units in the basin. Each hydrologic unit stands alone. These average annual sediment yields vary by hydrologic units from 290 tons per square mile for the Lower Pearl River hydrologic unit to 622 tons per square mile of drainage area for the Bogue Chitto hydrologic unit. The three hydrologic units with the highest average sediment yields (about 600 tons per square mile) are 3822, 3830, and 3850. See Map 2.1 for location of these hydrologic units. Hydrologic units 3811, 3813, and 3823 all have sediment yield rates of from 448 to 484 tons per square mile of drainage area. The remaining three hydrologic units--3812, 3821, and 3840--have sediment yield rates of 383, 348, and 290 tons per square mile, respectively.

The Middle Pearl River hydrologic unit has the largest sediment yield in total tons. Refer to the table for more details.

Forest Resources

Forest Area

Commercial forest land in all or parts of 23 counties of the Pearl Basin occupies over 3.0 million acres or 55.5 percent of the total land area of the Pearl. The area occupied by forest exceeds the combined acreage in all other land uses. The north half of the basin is predominantly in the Central Forest Survey Region, while the south half is predominantly in the South Forest Survey Region. Part of the basin is also in the Southwest Forest Survey Region (See Figure 4.4)

More than 2.3 million acres or three-fourths of all forest land is in nonindustrial private ownership (Table 4.15). Forest industry owns almost one-half million acres. Site class capability of all ownership indicates that 78 percent of the basin is capable of producing 85 cubic feet or more per acre per year (Table 4.16).

Between 1967 and 1977, the commercial forest land in the basin decreased about 60,000 acres. Most of the decrease stems from farmers clearing forest land to increase their pasture and crop acreages. However, some forest acreage losses are attributed to urban and commercial development, especially in Hancock, Hinds, and Rankin Counties.

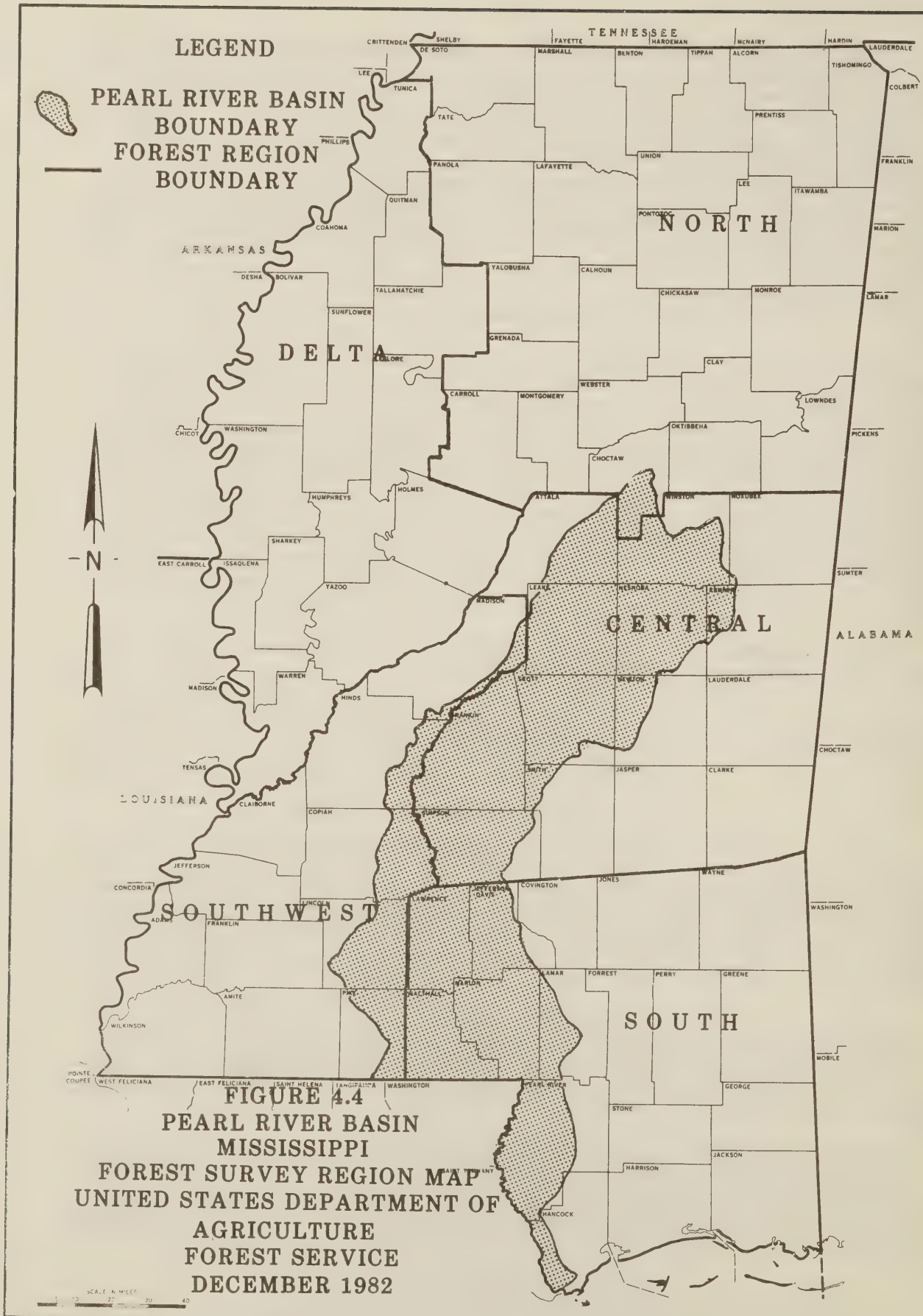


FIGURE 4.4
PEARL RIVER BASIN
MISSISSIPPI
FOREST SURVEY REGION MAP
UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DECEMBER 1982

Table 4.15. Area of commercial forest land by stand-size and ownership classes, Pearl River Basin, 1977

Stand-size class	All ownerships	National forest	Other public	Forest industry	Non-industrial private
	Thousand acres				
Sawtimber	1,339.2	50.5	49.3	215.4	1,024.0
Poletimber	893.3	33.8	32.9	143.7	682.9
Sapling and Seedling	761.7	28.8	28.0	122.6	582.3
Non-stocked areas	30.8	1.2	1.1	5.0	23.5
All classes	3,025.0	114.3	111.3	486.7	2,312.7

Source: Forest Statistics for Mississippi counties, SO-69, 1978.

Table 4.16. Area of commercial forest land by site and ownership classes, Pearl River Basin, 1977

Stand-size class	All ownerships	National forest	Other public	Forest industry	Non-industrial private
	Thousand acres				
165 cu. ft. or more	101.5	3.8	3.7	16.3	77.7
120 to 165 cu. ft.	642.5	24.3	23.6	103.4	491.2
85 to 120 cu. ft.	1,609.5	60.8	59.2	259.0	1,230.5
50 to 85 cu. ft.	633.7	23.9	23.3	102.0	484.5
Less than 50 cu. ft.	37.8	1.4	1.4	6.1	28.9
All classes	3,025.0	114.3	111.3	486.7	2,312.7

Source: Forest Statistics for Mississippi counties, SO-69, 1978.

The decline in forest area is likely to continue. Some additions to forest land will come from areas which are submarginal for farming. At the same time, diversions to agriculture, urbanization, and other uses will continue to expand.

Timber Volume and Growth

The Pearl River Basin forest lands contain 4.6 billion cubic feet of timber, according to the last Forest Survey of 1977. The inventory includes volume found in all kinds of trees, including those too rough and rotten to meet merchantability standards, as well as dead ones considered salvageable. Volume in growing stock, that is, trees presently or prospectively suitable for sawtimber, totals 3.2 billion cubic feet (58 percent softwood). This is an increase of 29 percent since 1967.

Softwood growing stock has gained substantially in the last 10 years and now stands at 1.9 billion cubic feet, consisting mostly of southern pine. Loblolly and shortleaf pine comprise almost two-thirds of all growing stock volume.

The current volume of growing stock represents a 34 percent gain over the 1967 inventory (Table 4.17). Between 1967 and 1976, the two most southern counties, Hancock and Pearl River, lost approximately one-third of their growing stock volume. Much of this loss is attributed to Hurricane Camille. However, during the same period of time, Hinds, Madison, Choctaw, Winston, Attala, and Pike Counties gained from 50 to 100 percent of growing stock volume. Counties which gained only from 25 to 50 percent growing stock volume during this period were Neshoba, Simpson, Smith, Scott, Kemper, Lawrence, Newton, and Leake.

Approximately 65 percent of the growing stock volume is in sawtimber-sized trees, which are at least 9 inches in diameter. The pine sawtimber portion of the inventory totals 7.2 billion board feet, which represents a 39 percent increase over the 1967 inventory (Table 4.18).

The hardwood growing stock of 1977 gained 23 percent over the inventory of 1967 (Table 4.17). Some southern-most counties lost hardwood growing stock. These include Hancock, Jefferson Davis, Pearl River, and Walthall Counties.

Hardwood sawtimber volume increased 38 percent between 1967 and 1977 (Table 4.18).

Yearly timber losses to fire, insects, disease, and other natural causes include 20 million cubic feet. Net annual growth in the Pearl in 1976 amounted to 129.4 million cubic feet of softwood growing stock and 65.1 million cubic feet of hardwood growing stock. Timber removals for 1976 amounted to 126.7 million cubic feet of softwood growing stock and 41.1 million cubic feet of hardwood growing stock. This means that the net growth for softwoods was only slightly greater than softwood removals for 1976.

For sawtimber alone, growth totaled 590 million board feet of softwood and 260 million board feet of hardwood in 1976. Sawtimber removals totaled 580 million board feet and 165 million board feet of hardwood for the same year.

Table 4.17. Growing stock volume in 1977 and change since 1967, Pearl River Basin

County[1/]	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million cubic feet	Percent	Million cubic feet	Percent
Attala	91.3	+ 92	74.4	+ 37
Choctaw	47.3	+118	25.7	+ 54
Copiah	73.7	+ 16	63.5	+ 19
Hancock	10.6	- 44	5.3	- 20
Hinds	16.1	+ 58	24.2	+ 44
Jefferson Davis	42.5	- 8	24.2	- 5
Kemper	22.8	+ 31	14.4	+ 15
Lamar	23.7	- 36	16.2	+ 24
Lawrence	126.7	+ 22	79.7	+ 29
Leake	155.6	+ 23	123.0	+ 17
Lincoln	87.1	+ 4	75.1	+ 28
Madison	17.1	+ 50	28.1	+ 47
Marion	72.0	- 6	88.5	+ 24
Neshoba	139.8	+ 30	127.7	+ 35
Newton	35.4	+ 27	30.7	+ 16
Pearl River	59.2	- 35	30.8	- 50
Pike	41.8	+ 50	38.6	+ 31
Rankin	224.1	+ 21	166.7	+ 10
Scott	196.3	+ 36	77.2	+ 5
Simpson	140.5	+ 41	81.1	+ 17
Smith	44.7	+ 27	22.3	+ 29
Walthall	53.1	+ 14	56.7	- 8
Winston	141.1	+ 56	61.7	+ 18
All counties	1,862.5	+ 34	1,335.8	+ 23

1/ Volumes are prorated according to percent of county within basin.

Table 4.18. Sawtimber volume in 1977 and change since 1967, Pearl River Basin

County[1/]	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million board feet	Percent	Million board feet	Percent
Attala	339.5	+ 57	176.0	+ 39
Choctaw	181.3	+ 59	45.1	+ 43
Copiah	331.4	+ 21	217.7	+ 35
Hancock	25.2	-180	11.4	- 56
Hinds	66.1	+ 64	82.1	+ 68
Jefferson Davis	89.5	-106	48.7	- 33
Kemper	100.8	+ 47	32.4	+ 33
Lamar	73.5	- 81	41.2	+ 8
Lawrence	378.9	- 2	267.3	+ 41
Leake	613.4	+ 34	339.7	+ 17
Lincoln	318.5	+ 7	210.7	+ 23
Madison	57.7	+ 47	92.7	+ 64
Marion	271.4	- 27	284.0	+ 32
Neshoba	658.6	+ 39	371.9	+ 46
Newton	134.8	+ 36	90.3	+ 18
Pearl River	177.7	- 74	83.8	- 35
Pike	159.6	+ 72	129.8	+ 37
Rankin	851.5	+ 27	497.1	+ 22
Scott	910.9	+ 50	233.4	+ 12
Simpson	511.4	+ 47	237.4	+ 38
Smith	199.1	+ 29	64.3	+ 50
Walthall	230.7	+ 20	180.9	- 18
Winston	527.8	+ 59	188.2	+ 30
All counties	7,209.3	+ 39	3,925.9	+ 38

1/ Volumes are prorated according to percent of county within basin.

CHAPTER V

NEEDS AND OPPORTUNITIES

General

The investigations and documentation of land and water resources made during the Pearl River Basin Study by USDA identified resource problems, needs, and opportunities throughout the basin. Present conditions are generally quantified in the previous chapter. This chapter quantifies needs for the future without project conditions for the year 2000. This future condition can be expected to occur if present programs continue without any acceleration.

Needs are quantified in data tables for cropland and pasture resources and for forest resources. Cropland and pasture needs are limited to the status of land treatment, flooding, and erosion. Potentials for land use changes (cropland and pasture) are also quantified. However, the potential for flood damage reduction was investigated only within the upstream watersheds. The effect of principal stream flood damage reduction by USDA was limited to the development of a system of retarding structures as a joint effort with the United States Corps of Engineers. Designs and costs were prepared by the Soil Conservation Service. The stage damage reductions were developed by the Corps of Engineers.

Gross erosion from all sources is listed in the tables and discussed. Cropland erosion is the largest contributor.

Cropland and Pasture

Status of Land Treatment

The cropland and pasture acreages for the future without project conditions for the year 2000 are quantified in Tables 5.1 and 5.2 for each of the hydrologic units of the study area by treatment needs. Overall for the basin, about 487.5 thousand acres of cropland will have a treatment need. However, about 112.0 thousand acres or 18.7 percent of the total cropland will be considered adequately protected or treated. Pasture acreages will have 554.8 thousand acres with treatment needs and 341.6 thousand acres or 38.1 percent of the total with adequate treatment.

The Upper Pearl River hydrologic unit contains the most acres of cropland and pasture with treatment needs. The Lower Pearl River hydrologic unit is next in magnitude. Refer to Table 5.1 for the distribution for the other hydrologic units.

Table 5.2 lists the cropland and pasture acreages for each hydrologic unit by soil hazards--erosion and water. Land treatment needs are greatest where erosion is the hazard. Overall, about 76 percent of the cropland with

Table 5.1. Status of land treatment, cropland and pasture by hydrologic units and basin totals, acres and percents, Pearl River Basin, Mississippi part, future without project conditions, 2000

Hydrologic Unit	Unit	Cropland		Pasture	
		Treatment adequate	Treatment needed	Treatment adequate	Treatment needed
Name and Code					
Upper Pearl River (3811)	Acres	18,377	94,416	50,963	103,935
	Percent	16.29	83.71	32.90	67.10
Tuscolameta Creek (3812)	Acres	7,343	39,247	25,312	50,918
	Percent	15.76	84.24	33.20	66.80
Yockanookany River (3813)	Acres	5,623	29,181	16,320	27,091
	Percent	16.16	83.84	37.59	62.41
Pearl River above Ross Barnett Dam (3821)	Acres	7,987	28,399	21,987	30,281
	Percent	21.95	78.05	42.07	57.93
Pearl River above Strong River (3822)	Acres	11,506	38,102	33,365	43,614
	Percent	23.19	76.81	43.34	56.66
Strong River (3823)	Acres	4,746	35,241	17,290	39,964
	Percent	11.87	88.13	30.20	69.80
Middle Pearl River (3830)	Acres	20,683	76,294	56,368	83,704
	Percent	21.33	78.67	40.24	59.76
Lower Pearl River (3840)	Acres	17,728	84,862	60,097	96,108
	Percent	17.28	82.72	38.47	61.53
Bogue Chitto (3850)	Acres	17,969	61,734	59,929	79,256
	Percent	22.55	77.45	43.06	56.94
Basin Total	Acres	111,962	487,476	341,631	554,871
	Percent	18.68	81.32	38.11	61.89

Source: Soil Conservation Service, United States Department of Agriculture.

Table 5.2. Status of land treatment, cropland and pasture, by soil hazard by hydrologic unit, Subregion 0318, Pearl River Basin, Mississippi, future (2000) without project conditions

Hydrologic unit and soil subclass	Hazard	Cropland: Treatment adequate	Cropland: Treatment needed	Pastureland: Treatment adequate	Pastureland: Treatment needed
		Acres	Acres	Acres	Acres
Hydrologic Unit 3811 (Upper Pearl River)					
"e" soils	Erosion 1/	6,243	67,448	32,735	82,437
"w"	Water	12,134	26,968	18,228	21,436
Other soils	2/	0	0	0	62
Hydrologic unit total: (acres)	xxxxxxx	18,377	94,416	50,963	103,935
(percent)	xxxxxxx	16.29	83.71	32.90	67.10
Hydrologic Unit 3812 (Tuscolameta Creek)					
"e" soils	Erosion 1/	3,582	27,498	17,405	37,574
"w" soils	Water	3,761	11,749	7,907	13,282
Other soils	2/	0	0	0	62
Hydrologic unit total: (acres)	xxxxxxx	7,343	39,247	25,312	50,918
(percent)	xxxxxxx	15.76	84.24	33.20	66.80
Hydrologic Unit 3813 (Yockanookany River)					
"e" soils	Erosion 1/	1,766	20,979	9,117	21,641
"w" soils	Water	3,857	8,202	7,203	5,450
Other soils	2/	0	0	0	0
Hydrologic unit total: (acres)	xxxxxxx	5,623	29,181	16,320	27,091
(percent)	xxxxxxx	16.16	83.84	37.59	62.41
Hydrologic Unit 3821 (Pearl River above Ross Barnett Dam)					
"e" soils	Erosion 1/	6,282	23,086	18,119	25,352
"w" soils	Water	1,705	5,313	3,868	4,806
Other soils	2/	0	0	0	123
Hydrologic unit total: (acres)	xxxxxxx	7,987	28,399	21,987	30,281
(percent)		21.95	78.05	42.07	57.93
Hydrologic Unit 3822 (Pearl River above Strong River)					
"e" soils	Erosion 1/	4,732	26,869	23,715	37,165
"w"	Water	5,371	10,892	9,356	6,201
Other soils	2/	1,403	341	294	248
Hydrologic unit total: (acres)	xxxxxxx	11,506	38,102	33,365	43,614
(percent)	xxxxxxx	23.19	76.81	43.34	56.66
Hydrologic Unit 3823 (Strong River)					
"e" soils	Erosion 1/	1,851	27,185	11,567	30,690
"w" soils	Water	2,895	8,056	5,723	9,274
Other soils	2/	0	0	0	0
Hydrologic unit total: (acres)	xxxxxxx	4,746	35,241	17,290	39,964
(percent)	xxxxxxx	11.87	88.13	30.20	69.80
Hydrologic Unit 3830 (Middle Pearl River)					
"e" soils	Erosion 1/	10,018	60,107	42,705	68,309
"w" soils	Water	5,445	14,859	12,012	14,575
Other soils	2/	5,220	1,328	1,651	820
Hydrologic unit total: (acres)	xxxxxxx	20,683	76,294	56,368	83,704
(percent)	xxxxxxx	21.33	78.67	40.24	59.76
Hydrologic Unit 3840 (Lower Pearl River, Mississippi part)					
"e" soils	Erosion 1/	11,830	66,545	50,180	83,782
"w" soils	Water	5,311	18,224	9,917	12,017
Other soils	2/	587	93	0	309
Hydrologic unit total: (acres)	xxxxxxx	17,728	84,862	60,097	96,108
(percent)		17.28	82.72	38.47	61.53
Hydrologic Unit 3850 (Bogue Chitto, Mississippi part)					
"e" soils	Erosion 1/	11,564	49,185	48,491	68,626
"w"	Water	5,663	12,549	11,438	9,395
Other soils	2/	742	0	0	1,235
Hydrologic unit total: (acres)	xxxxxxx	17,969	61,734	59,929	79,256
(percent)	xxxxxxx	22.55	77.45	43.06	56.94
BASIN Hydrologic Unit TOTAL					
"e" soils	Erosion 1/	57,868	368,902	254,034	455,576
"w" soils	Water	46,142	116,812	85,652	96,436
Other soils	2/	7,952	1,762	1,945	2,859
Hydrologic unit total: (acres)	xxxxxxx	111,962	487,476	341,631	554,871
(percent)	xxxxxxx	18.68	81.32	38.11	61.89

Source: Soil Conservation Service, United States Department of Agriculture.

1/ Also includes "s" soils (properties) that make up a very small part of the total.
2/ Includes Class 1 soils and areas without soil classification.

treatment needs will be on erosive soils. For pasture, about 81 percent of the treatment needs occurs on erosive soils. Refer to Table 5.2 for more details.

Many cropland acres within the basin will be eroding at rates that are considered critical. Generally, this means the soil resource is being damaged. Of the 599.4 thousand acres of cropland projected for the year 2000 (Table 3.17), about 109.0 thousand acres or about 18 percent of the total will be eroding at a critical rate (Table 5.3). About two-thirds of these acres or 72.4 thousand acres will be on Land Capability Subclass 3e. About 32.2 thousand acres will be on Land Capability Subclass 4e, with the remaining 4.5 thousand on 6e and 7e subclasses. Refer to Table 5.3 for more details on the distribution by hydrologic units and for the basin totals.

Opportunities are available through existing United States Department of Agriculture programs to improve the overall quality of the land and water resources of the Pearl River Basin. These opportunities include accelerated land treatment and flood damage reduction.

Potential Land Use Changes

A review of data for the Pearl River Basin points out the opportunity to make better use of some of the cropland and pasture resources. These resources are displayed in Table 3.17 for the present and future without project conditions. A total of about 1.5 million acres are available. However, 29.0 percent or 434.3 thousand acres of the total are Land Capability Subclasses 4e, 6e, and 7e. The use of these very steep soils for cropland creates problems and usually leads to deterioration of the resource base. About 207.6 thousand acres of the 434.3 thousand acres are listed in the category of cropland. Many of these acres are idle and have cover. About 33.4 percent of the sheet erosion from cropland for the future without project condition will be from this 4e-6e-7e group (Table 5.10).

Table 5.3 lists 109.0 thousand acres as cropland with critical erosion. The 4e-6e-7e group accounts for 36.6 thousand acres. Opportunities exist to convert these acres to a different land use to reduce erosion rates and deterioration of the soil resource base.

These 36.6 thousand acres are projected to be in crops. The remaining acres in the 4e-6e-7e group are generally idle. A conversion to a different use is needed for these 170.9 thousand acres to increase income.

The remaining use of the 4e-6e-7e group is in the category pasture and totals 226.8 thousand acres for the future without project conditions. Many of these acres need protection or a different use based on the average annual erosion rates of 8.8 tons per acre on pasture with treatment needs (Table 5.10). About three-fourths of the soil loss on pasture acres will be from the 4e-6e-7e subclass group for the projected conditions.

Table 5.3. Critical erosion of cropland acreage by erosion hazard subclass by hydrologic unit and basin total, Subregion 0318, Pearl River Basin, Mississippi part, future without project, 2000

Hydrologic unit name and number	Cropland with critical erosion			
	3e	4e	6e, 7e	Total
	Acres	Acres	Acres	Acres
Upper Pearl River (3811)	15,230	12,051	265	27,546
Tuscolameta Creek (3812)	8,538	4,535	372	13,445
Yockanookany River (3813)	4,490	465	318	5,273
Pearl River above Ross Barnett Dam (3821)	7,437	478	176	8,091
Pearl River above Strong River (3822)	10,959	1,882	333	13,174
Strong River (3823)	5,818	1,727	848	8,393
Middle Pearl River (3830)	7,159	2,694	277	10,130
Lower Pearl River (3840)	5,104	4,455	1,549	11,108
Bogue Chitto (3850)	7,662	3,894	326	11,882
Basin Total	72,397	32,181	4,464	109,042

Source: Soil Conservation Service, United States Department of Agriculture

Flooding

General

Flooding is projected to be a major problem throughout the basin for the future without project conditions, year 2000. The problem will exist in the upstream watersheds and along the principal stream reaches. The areas subject to flooding will generally be the same as for the present, about 1.3 million acres. The upstream watersheds contain about 918.0 thousand acres of flood plain, with the remaining 334.7 thousand acres being principal stream flood plain. The Upper Pearl River hydrologic unit has the most acres subject to flooding. Refer to Table 4.5 for the distribution for the other hydrologic units.

Flood Plain Land Use

The future without project conditions for the year 2000 are slightly different from the present conditions described in Chapter IV. The major land uses shown in Table 5.4 are the same as for the present but the crop and pasture distribution throughout the flood plain is different. These crop and pasture distributions are shown in Tables 5.5 and 5.6. Cropland increases from about 9.8 percent for the present to 11.5 percent of the total flood plain by the year 2000. Pasture use decreases from about 14.6 percent for the present to 12.9 percent for the future without project conditions, year 2000. Refer to Table 5.5 for these distributions by hydrologic units and for the total basin as a part of the total flood plain.

Table 5.6 provides a crop and pasture distribution by percents for each hydrologic unit and for the basin. This distribution is for the part of the flood plain being used for crops and pasture. Overall, the distribution is about equal, with cropland being 47.2 percent of the total and pasture being about 52.8 percent. Soybeans is the largest crop in terms of acres, with cotton next in size. Refer to Table 5.6 for the distribution for each of the hydrologic units.

Flood Damages

Average annual flood damges for the future without project conditions, year 2000, were estimated for each hydrologic unit and for the basin. Agricultural and nonagricultural damages are included. Total flood damages of $17.4 million will occur throughout the basin. However, only the crop and pasture damages change for these future conditions. While these other kinds of flood damages will probably increase, the projections of these future damages were outside the scope of the USDA study.

Crop and pasture damages increased from about $7.7 million for the present on an average annual basis to about $10.8 million for the projected conditions. The overall increase in acres used for crops plus the large increase in soybean acres accounted for most of the increase. Refer to Table 5.7 for the distribution of flood damages by hydrologic units.

Table 5.4. Flood plain land use distribution on land subject to flooding by hydrologic units and basin totals, Pearl River Basin, Mississippi part, future without project (2000)

Hydrologic unit code and name	Agri-cultural	Forest	Urban and built-up	Other
	Percents			
Pearl River (0318)[1/]				
Cataloging Unit 03180001[1/]				
Upper Pearl River (3811)[2/]	29.85	66.14	2.35	1.66
Tuscolameta Creek (3812)	27.10	68.91	1.25	2.74
Yockanookany River (3813)	32.18	63.31	3.34	1.17
Cataloging Unit 03180002				
Pearl River above Ross Barnett Dam (3821)	14.63	81.00	1.51	2.86
Pearl River above Strong River (3822)	22.01	65.88	8.47	3.84
Strong River (3823)	25.46	70.51	2.28	1.75
Cataloging Unit 03180003				
Middle Pearl River (3830)	24.60	71.21	2.22	1.97
Cataloging Unit 03180004, Mississippi part				
Lower Pearl River (3840)	16.10	73.80	2.23	7.87
Cataloging Unit 03180005, Mississippi part				
Bogue Chitto (3850)	28.44	67.09	2.58	1.89
BASIN TOTALS	24.50	69.58	2.77	3.15

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.
2/ Mississippi Data Base (MARIS) hydrologic unit code.

Table 5.5. Cropland and pasture distribution on the land subject to flooding by hydrologic units, Pearl River Basin, Mississippi part, future without project (2000)

Hydrologic unit name and code	As a part of the total floodplain									
	Cropland						Pasture			Cropland and pasture totals
	Cotton	Corn	Wheat	Soybeans	Miscellaneous	TOTAL	Improved	Unimproved	TOTAL	
	Percent									
Pearl River (0318)[1]										
Cataloging Unit 03180001[1]										
Upper Pearl River (3811)[2]	1.38	.87	.14	9.56	2.79	14.74	12.02	2.94	14.96	29.70
Tuscolameta Creek (3812)	.65	.43	.07	5.95	4.28	11.38	11.00	4.54	15.54	26.92
Yockanookany River (3813)	2.44	.85	0	10.17	2.17	15.63	14.18	2.22	16.40	32.03
Cataloging Unit 03180002										
Pearl River above Ross Barnett Dam (3821)	1.00	.17	0	3.00	2.48	6.65	5.65	2.33	7.98	14.63
Pearl River above Strong River (3822)	1.87	.70	.17	7.22	1.21	11.17	9.42	1.36	10.78	21.95
Strong River (3823)	.95	.40	.03	5.48	3.94	10.80	10.19	4.28	14.47	25.27
Cataloging Unit 03180003										
Middle Pearl River (3830)	.10	.63	.14	6.79	2.99	10.65	11.05	2.90	13.95	24.60
Cataloging Unit 03180004, Mississippi part										
Lower Pearl River (3840)	0	.38	0	4.54	3.11	8.03	6.62	1.45	8.07	16.10
Cataloging Unit 03180005, Mississippi part										
Bogue Chitto (3850)	0	.87	0	10.42	1.98	13.27	13.30	1.87	15.17	28.44
BASIN TOTALS	.85	.62	.07	7.17	2.81	11.52	10.32	2.58	12.90	24.42

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.
2/ Mississippi Data Base (MARIS) hydrologic unit code.

Table 5.6. Cropland and pasture distribution on the land subject to flooding by hydrologic units, Pearl River Basin, Mississippi part, future without project (2000)

Hydrologic unit name and code	As a part of the cropland and pasture use in the floodplain									
	Cropland						Pasture			Cropland and pasture totals
	Cotton	Corn	Wheat	Soybeans	Miscellaneous	TOTAL	Improved	Unimproved	TOTAL	
	Percent									
Pearl River (0318)[1]										
Cataloging Unit 03180001[1]										
Upper Pearl River (3811)[2]	4.65	2.93	.48	32.20	9.37	49.63	40.48	9.89	50.37	100.00
Tuscolameta Creek (3812)	2.43	1.59	.25	22.11	15.88	42.26	40.85	16.89	57.74	100.00
Yockanookany River (3813)	7.61	2.65	0	31.76	6.78	48.80	44.28	6.92	51.20	100.00
Cataloging Unit 03180002										
Pearl River above Ross Barnett Dam (3821)	6.80	1.17	0	20.54	16.95	45.46	38.61	15.93	54.54	100.00
Pearl River above Strong River (3822)	8.52	3.21	.78	32.87	5.53	50.91	42.90	6.19	49.09	100.00
Strong River (3823)	3.75	1.57	.10	21.70	15.59	42.71	40.35	16.94	57.29	100.00
Cataloging Unit 03180003										
Middle Pearl River (3830)	.43	2.54	.57	27.62	12.14	43.30	44.90	11.80	56.70	100.00
Cataloging Unit 03180004, Mississippi part										
Lower Pearl River (3840)	0	2.33	0	28.20	19.34	49.87	41.13	9.00	50.13	100.00
Cataloging Unit 03180005, Mississippi part										
Bogue Chitto (3850)	0	3.06	0	36.63	6.95	46.64	46.76	6.60	53.36	100.00
BASIN TOTALS	3.47	2.52	.30	29.38	11.50	47.17	42.25	10.58	52.83	100.00

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.
2/ Mississippi Data Base (MARIS) hydrologic unit code.

Table 5.7. Flood damages by agricultural and non-agricultural damages by hydrologic unit and basin total, Pearl River Basin Study, Mississippi part, future without project (2000)

Hydrologic unit code and name	Flood damages (average annual)					
	Agricultural		Non-agricultural			
	Crops and pasture	Improvements	Roads, bridges, and railroads	Urban and built-up	Other	Total damages
	Thousand dollars					
Pearl River (0318)[1]						
Cataloging Unit 03180001[1]						
Upper Pearl River (3811)[2]	3,195	266	438	280	356	4,535
Tuscolameta Creek (3812)	903	76	161	51	102	1,293
Yockanookany River (3813)	1,088	97	154	84	127	1,550
Cataloging Unit 03180002						
Pearl River above Ross Barnett Dam (3821)	449	42	155	42	65	753
Pearl River above Strong River (3822)	872	91	227	829	212	2,231
Strong River (3823)	735	77	192	65	108	1,177
Cataloging Unit 03180003						
Middle Pearl River (3830)	1,311	118	349	131	177	2,086
Cataloging Unit 03180004, Mississippi Part						
Lower Pearl River (3840)	1,044	70	341	271	141	1,867
Cataloging Unit 03180005, Mississippi Part						
Bogue Chitto (3850)	1,159	89	350	148	148	1,894
Basin Totals	10,756	926	2,367	1,901	1,436	17,386

Source: Soil Conservation Service.

1/ Number code from Mississippi Hydrologic Unit Map, 1974.
2/ Mississippi Data Base (MARIS) hydrologic unit code.

Sheet Erosion

Sheet erosion rates vary throughout the basin. The rates are a function of the land use and cover, soil characteristics, rainfall distribution and intensity, and the general overall management of the land. Sheet erosion is a natural event and occurs on each acre of cropland, pasture, forest, and other areas. The average annual sheet erosion from forest includes disturbed and undisturbed areas.

The estimated average annual sheet erosion for the basin and for each of the hyrdologic units is tabulated in Table 5.8. Overall, for the projected future without project conditions, the total is 13.4 million tons or an average of about 1.7 thousand tons per square mile. The projected total sheet erosion is an increase of about 22 percent over the present rate of about 1.4 thousand tons per square mile. Most of this increase is caused by the 200 thousand increase in soybean acres. See Table 5.9 for the present and future crop distribution. Cropland, with 7.8 million tons of average annual sheet erosion, accounts for about 58.0 percent of the total sheet erosion.

The total average annual sheet erosion rates vary throughout the basin by hydrologic units. These rates vary from about 1.3 thousand tons per square mile for the Pearl River above Ross Barnett Reservoir and the Lower Pearl River hydrologic units to about 2.3 thousand tons for the Middle Pearl River and Bogue Chitto hydrologic units.

Cropland sheet erosion rates exceed those of other uses throughout the basin. The average sheet erosion from each acre of cropland is about 13.0 tons per acre or about 8.3 thousand tons from each square mile of cropland. The average rate for the present condition is about 11.2 tons per acre. Rates on untreated cropland exceed 100 tons per acre on the very steep soils. Rates on adequately protected cropland are less than 4 to 5 tons per acre. Table 5.10 lists cropland soil loss by land capability subclass groups and treatment status.

Average annual sheet erosion rates also vary for cropland by hydrologic units. Generally, the rates average less than 4 tons per acre on adequately protected acres. However, for the unprotected cropland acres, average rates exceed 15.0 tons per acre for hydrologic units 3811, 3812, 3821, 3822, and 3850. The remaining hydrologic units have average rates that exceed 12.0 tons per acre.

Sheet erosion from pasture amounts to 2.3 million tons, average annual, or about 16.9 percent of the total sheet erosion for the basin. Forest contributes 3.4 million tons of erosion from disturbed and natural, undisturbed forest land.

Refer to Table 5.8 for distribution of sheet erosion by sources for the hydrologic units.

Gross Erosion

Gross erosion estimates are included in Table 5.11 for each hydrologic unit. These total estimates are for the projected conditions, year 2000.

Table 5.8. Estimated average annual sheet erosion by hydrologic unit, Pearl River Basin, Subregion 0318, Mississippi part, future without project (2000)

Hydrologic unit 1/		Drainage area	Source of sheet erosion				
			Cropland	Pasture	Forest 2/	Other	TOTAL
Code	Name	Square miles	Thousand tons				
3811	Upper Pearl River	1,409.4	1,495.9	475.1	309.3	3.2	2,283.5
3812	Tuscolameta Creek	576.2	678.9	150.9	63.3	2.3	895.4
3813	Yockanookany River	478.8	373.9	154.5	191.0	0.3	719.7
3821	Pearl River above Ross Barnett Dam	588.6	568.6	85.8	91.5	2.2	748.1
3822	Pearl River above Strong River	704.7	851.7	180.9	116.8	0.2	1,149.6
3823	Strong River	687.8	518.5	191.4	564.6	4.0	1,278.5
3830	Middle Pearl River	1,221.8	1,031.6	418.4	1,366.6	0.1	2,816.7
3840	Lower Pearl River	1,283.3	1,084.5	349.2	178.3	0.3	1,612.3
3850	Bogue Chitto	841.3	1,171.4	258.0	482.5	0	1,911.9
0318	PEARL RIVER BASIN TOTAL	7,791.9	7,775.0	2,264.2	3,363.9	12.6	13,415.7
	Tons per acre		13.0	2.5	1.1	xxx	2.7

Source: Soil Conservation Service

1/ Mississippi part only.

2/ Includes erosion on disturbed forest land and natural, undisturbed forest land.

Table 5.9. Crop and pasture acreage, Pearl River Basin, Subregion 0318, Mississippi part, present and future without project conditions (2000)

Crop	Present conditions (1975)	Future without project conditions (2000)
	Acres	Acres
Cotton	37,368	19,624
Corn	31,681	22,409
Wheat	7,147	6,939
Soybeans	126,602	325,975
Miscellaneous and idle	390,012	224,491
Crop Total	592,810	599,438
Improved pasture	674,454	707,070
Unimproved pasture	228,676	189,432
Pasture Total	903,130	896,502
TOTALS	1,495,940	1,495,940

Source: Mississippi Statewide Cooperative River Basin Study, Phase I.

Table 5.10. Estimated average annual soil loss on cropland and pasture by land treatment status by subclass groupings, Pearl River Basin, Subregion 0318, Mississippi part, future without project (2000)

Item	Item	Land capability subclass groups			TOTALS
		2e, 3e	4e, 6e, 7e 1/	Other 2/	
Cropland					
Treatment adequate	Thousand tons	183.9	4.9	174.1	362.9
	Tons per acre	3.30	3.80	3.21	xxxx
Treatment needed	Thousand tons	4,138.5	2,594.4	679.2	7,412.1
	Tons per acre	25.40	66.18	5.71	xxxx
Totals	Thousand tons	4,322.4	2,599.3	853.3	7,775.0
	Percent of total	55.6	33.4	11.0	100.0
Pasture					
Treatment adequate	Thousand tons	56.4	28.6	4.4	89.4
	Tons per acre	0.27	0.66	0.05	xxxx
Treatment needed	Thousand tons	530.8	1,621.9	22.1	2,174.8
	Tons per acre	1.97	8.83	0.22	xxxx
Totals	Thousand tons	587.2	1,650.5	26.5	2,264.2
	Percent of total	25.9	72.9	1.2	100.0

Source: Soil Conservation Service.

1/ Rates exclude idle cropland and miscellaneous crops.
2/ Includes all class 1, all subclass "w" and "s" and areas without soil classifications.

Table 5.11. Estimated average annual erosion and sediment yield by hydrologic unit, Pearl River Basin, Subregion 0318, Mississippi part, future without project (2000)

Hydrologic unit[1]		Drainage area	Type of erosion						Total gross erosion	Sediment yield[2]	
Code	Name	Square mile	Sheet	Gully	Streambank	Roadbank	Surface mines	Urban	Thousand tons		Tons per square mile
3811	Upper Pearl River	1,409.4	2,283.5	344.1	1,098.5	148.6	55.4	0	3,930.1	786.0	558
3812	Tuscolameta Creek	576.2	895.4	159.8	188.3	49.3	4.3	0	1,297.1	285.4	495
3813	Yockanookany River	478.8	719.7	88.4	96.9	19.8	6.6	0	931.4	204.9	428
3821	Pearl River above Ross Barnett Dam	588.6	748.1	181.6	106.3	20.7	14.6	4.2	1,075.5	225.9[3]	383
3822	Pearl River above Strong River	704.7	1,149.6	261.6	277.9	28.8	255.7	10.5	1,984.1	416.7	591
3823	Strong River	687.8	1,278.5	231.4	336.7	39.0	30.6	0	1,916.2	402.4	585
3830	Middle Pearl River	1,221.8	2,816.7	197.7	1,181.7	113.8	112.9	0	4,422.8	884.6	724
3840	Lower Pearl River	1,283.3	1,612.3	133.8	347.1	106.5	40.9	4.4	2,245.0	449.0	350
3850	Bogue Chitto	841.3	1,911.9	159.9	581.2	43.4	43.9	0	2,740.3	575.5	684
0318	Pearl River Basin Total	7,791.9	13,415.7	1,758.3	4,214.6	569.9	564.9	19.1	20,542.5	xxxxx	xxx

1/ Mississippi part only.
2/ Total is for hydrologic unit only
3/ Includes 198.8 trapped by reservoir.

For the Pearl River Basin, total average annual gross erosion amounts to 20.5 million tons or about 2.6 thousand tons per square mile. This total is about a 15 percent increase over the present gross erosion.

Sheet erosion is the largest contributor to gross erosion, amounting to 65.3 percent of the total. Streambanks contribute 20.5 percent; gullies, 8.6 percent; roadbanks, 2.8 percent; and surface mines, 2.7 percent of the total. Urban erosion amounts to one-tenth of one percent of the total gross erosion. Refer to Table 5.11 for more details on distribution by hydrologic units.

Sediment Yield

Sediment yield, as described previously in Chapter IV, is that portion of gross erosion that is eventually transported in suspension to the mouth of the watershed. Table 5.11 lists the sediment yield for each hydrologic unit of the basin. The basin yield is not shown as the totals were not routed through the basin. Each unit stands alone.

The sediment yields are shown in thousands of tons and in tons per square mile. In terms of overall quantities, the Middle Pearl River hydrologic unit, with a yield of 884.6 thousand tons annually, and the Upper Pearl River hydrologic unit, with a yield of 786.0 thousand tons, contribute the most sediment. The least amount is for the Pearl River above Ross Barnett Reservoir hydrologic unit. In terms of tons per square mile of sediment yield, quantities vary from 350 tons per square mile for the Lower Pearl River hydrologic unit to 724 tons per square mile for the Middle Pearl River hydrologic unit. A need exists throughout the basin to reduce these projected sediment yields. Refer to Table 5.11 for more details.

Potentials for Flood Damage Reduction

General

Flooding, as discussed previously, occurs throughout the Pearl River Basin. This USDA study addressed the issue of flood damage reduction generally in two categories. The potential for reducing flood damages in upstream watersheds was investigated, as well as the potential to reduce flood damages within the principal stream flood plain. The United States Department of Agriculture, with the Soil Conservation Service as the lead agency, had the responsibility for the upstream watershed investigations. The United States Department of Agriculture and Corps of Engineers investigated the potentials for reducing flood damages along the principal streams. The Corps of Engineers had the primary responsibility. The Soil Conservation Service designed and provided cost data for a potential system of intermediate size floodwater retarding structures for reducing principal stream flood damages. The Corps of Engineers performed the hydrologic investigations and economic evaluations for this alternative system. Other alternatives were also investigated by the Corps of Engineers. These alternatives are not a part of this report.

Upstream Watersheds

General -- Upstream watersheds of the study area were recommended for future study in the USDA report, "Agricultural Requirements and Upstream Watershed Development, Pearl River Basin," dated September 1971. At that time the watersheds had the potential for an upstream watershed project under the authority of Public Law 566. These recommended projects all had the potential for flood damage reduction benefits. Also, land treatment was a part of the proposed small watershed projects.

The plan-of-work prepared for the Pearl River Basin study area contained activites for making a reevaluation of the watersheds proposed in the 1971 USDA report. This reevaluation was necessary as construction costs, interest rates, environmental requirements, and planning criteria all have changed. The results of the 1971 study were used in preparing a priority list for reevaluation. The Upper Pearl River Area (Map 2.2) was the location of many of the proposed watersheds of the 1971 study. Therefore, watersheds with the highest benefit-cost ratio were selected for the reevaluations within this general area. Nineteen watersheds were studied. The results were documented in Interim Reports prepared as the study progressed. Three watersheds with the best potential for a project were selected for study in some detail. These are discussed below. Data for the sixteen watersheds studied in less detail are included in the Appendix.

Location and Size -- The three watersheds selected are located in the upper reaches of the Pearl River Basin. One is mostly in Winston County, one is within Neshoba County, and the other is mostly in Choctaw County. See Table 5.12 for watershed number, total area, and counties involved. Also, see location Map 5.1 for location within the basin.

Major Land Use -- The major land uses from the Mississippi Data Base are listed on Table 5.13 for each of the three selected watersheds. Forest is the dominant land use, with nearly 71 percent of the total area for Tibby Creek Watershed, 62 percent for Kentawka Creek Watershed, and 51 percent for Nanawaya Creek Watershed. Agricultural uses vary from an estimated 24 percent in the Tibby Creek Watershed to 43 percent in the Nanawaya Creek Watershed. Urban and built-up areas and other uses account for the remaining land uses. See the table for acres, percents, and more details. Soybeans is the major crop being grown, with corn second. Some cotton and wheat are also grown. Pasture is the largest use of the agricultural land and accounts for more than 55 percent of the area being used for crops and pasture.

Status of Land Treatment -- Resource management systems are needed on many acres being used for cropland and pasture. These acreages are listed for each of the three selected upstream watersheds in Table 5.14 by hazards. The soils with erosion hazards are grouped by subclasses (2e-3e-4e) and (6e-7e). Erosion rates on cropland in the 2e-3e-4e group may be as high as 50 tons per acre, while for the second group rates will exceed 100 tons per acre. This second group (6e-7e) is generally considered as critical areas if used for row crops. However, many of these acres are probably idle and have some cover. A different use of the land is needed to reduce erosion and increase income.

Table 5.12. List of upstream watersheds studied in some detail, Pearl River Basin Study, Mississippi, 1982

Watershed		Size	Counties
Name	Number	Acres	Name
Nanawaya Creek	03180001-010	85,565	Winston, Kemper, Neshoba, Noxubee
Kentawka Creek	03180001-070	124,178	Neshoba
Tibby Creek	03180001-270	84,330	Choctaw, Attala

Source: Soil Conservation Service

Table 5.13. Major land use by upstream watersheds, acres and percents, Pearl River Basin, Mississippi, present, 1976

Watershed name and number	Unit	Major land use				Total
		Agriculture	Forest	Urban and built-up	Other	
Nanawaya Creek 03180001-010	Acres	37,315	43,184	4,202	864	85,565
	Percent	43.6	50.5	4.9	1.0	100.0
Kentawka Creek 03180001-070	Acres	37,068	77,287	7,290	2,533	124,178
	Percent	29.9	62.2	5.9	2.0	100.0
Tibby Creek 03180001-270	Acres	20,449	59,741	3,892	248	84,330
	Percent	24.3	70.8	4.6	0.3	100.0

Source: Mississippi Data Base (MARIS)

MAP 5.1
PEARL RIVER BASIN
MISSISSIPPI
WATERSHED EVALUATION MAP
SOIL CONSERVATION SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE
DECEMBER 1982

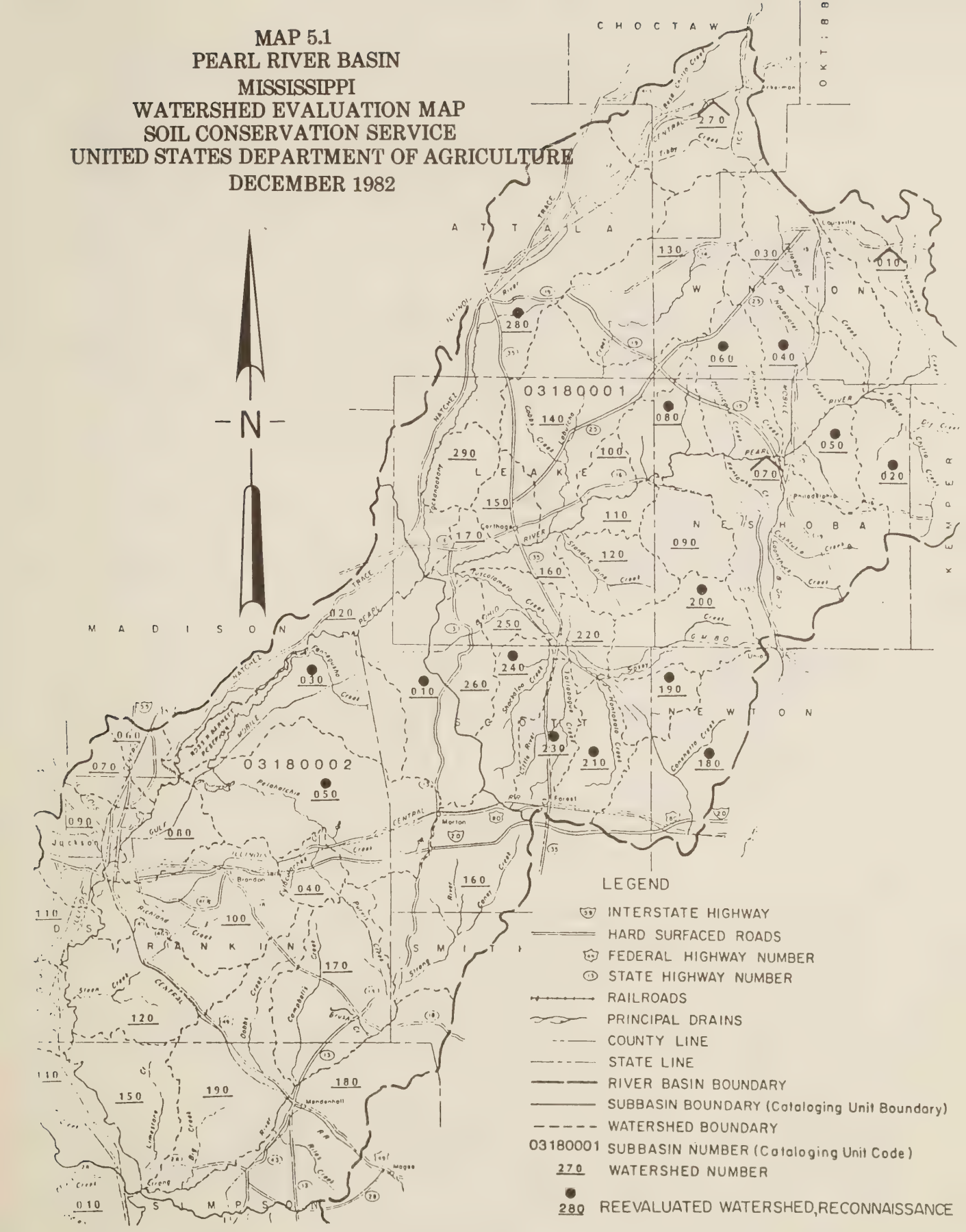


Table 5.14. Cropland and pasture soil resources by hazards and status of land treatment, selected upstream watersheds, Pearl River Basin, Mississippi, present, 1981

Item	Unit	Watershed name and number		
		03180001-010 Nanawaya Creek	03180001-070 Kentawka Creek	03180001-270 Tibby Creek
Erosion Hazard Soils				
Subclasses 2e, 3e, 4e				
Cropland				
Treatment adequate	Acres	2,786	364	870
Treatment needed	Acres	10,364	2,816	3,580
Pasture				
Treatment adequate	Acres	6,944	3,814	2,039
Treatment needed	Acres	9,436	7,400	3,087
Subclasses 6e, 7e				
Cropland				
Treatment adequate	Acres	--	--	--
Treatment needed	Acres	400	7,443	1,850
Pasture				
Treatment adequate	Acres	79	384	420
Treatment needed	Acres	386	3,911	2,363
Water Hazard Soils				
All subclasses				
Cropland				
Treatment adequate	Acres	890	849	920
Treatment needed	Acres	2,060	2,412	1,780
Pasture				
Treatment adequate	Acres	1,415	3,207	1,655
Treatment needed	Acres	2,493	4,344	1,885
TOTALS				
Cropland				
Treatment adequate	Acres	3,676	1,213	1,790
Treatment needed	Acres	12,824	12,671	7,210
Pasture				
Treatment adequate	Acres	8,438	7,405	4,114
Treatment needed	Acres	12,315	15,655	7,335
TOTAL CROPLAND	Acres	16,500	13,884	9,000
TOTAL PASTURE	Acres	20,753	23,060	11,449
OVERALL TOTAL	Acres	37,253	36,944	20,449

Source: Soil Conservation Service.

Overall, for the three selected watersheds, about 80 to 90 percent of the cropland needs a resource management system to be considered adequately protected. About 60 to 70 percent of the pasture does not have an adequate resource management system. Refer to Table 5.14 for more details.

Flooding -- Flooding is a problem in all three of the selected upstream watersheds. The depth of flooding for the 100-year storm ranges to a maximum of from 5 to 7 feet throughout the watersheds. Floods of varying frequencies occur on the average of from one to five times per year depending on the flood plain location.

Table 5.15 lists the areas subject to flooding, land use in the flood plain, and average annual flood damages for the three watersheds. The acres flooded are about 14 to 19 percent of the total watershed areas. Additional flooded acres occur along the Pearl River for Kentawka Creek. Land use in the flooded areas consists of 60 to 70 percent woods, 19 to 32 percent pasture, and 6 to 13 percent cropland. Flood damages on an average annual basis, based on total flood plain, vary from about 6 to 7 dollars per acre. Refer to Table 5.15 for more details.

Alternative Plans -- Three alternative plans for reducing flood damages were evaluated. The results are included in Table 5.16. This table includes the structural measures, percent controlled by retarding structures, costs, benefited areas, average annual costs and benefits, and benefit-cost ratios. As outlined on the table, no alternative has a favorable benefit-cost ratio. In fact, none are close to 1.0. Refer to Table 5.16 for more details.

Conclusions and Recommendations -- The results of the reevaluations of the three selected watersheds studied in some detail do not compare closely with the 1970 Pearl River Basin study results. Some of the reasons are as follows: (1) criteria for watershed planning have changed, (2) construction costs and other installation costs have increased, (3) interest rates have increased, and (4) present criteria dictated that channel improvement not be considered.

Overall, the evaluation results point out that a favorable benefit-cost ratio for these projects appears impossible under present conditions. However, much of the open land being used for crops and pasture is not adequately protected.

Recommendations, based on the reevaluation results, are as follows:

1. Future planning in the overall watersheds to reduce flood damages is not recommended. Small parts of the watersheds may have a potential for planning to reduce flood damages.

2. The amount of open land and the amount of cropland and pasture on erosion hazard soils plus the low percent of these acres that are adequately protected make these watersheds candidates for accelerated land treatment. Recommendations are that any immediate future planning in these watersheds be limited to improving the resource management systems on the open land classed as agricultural.

Table 5.15. Areas subject to flooding, land use in flood plain, and flood damages, upstream watersheds, Pearl River Basin, Mississippi, present, 1981

Item	Unit	Watershed name and number		
		03180001-010 Nanawaya Creek	03180001-070 Kentawka Creek	03180001-270 Tibby Creek
Area subject to flooding (100-year flood plain)	Acres	16,769	16,996	13,167
Land use in flood plain:				
Cropland	Acres	1,996	936	1,710
	Percent	11.9	5.5	13.0
Pasture	Acres	3,101	5,486	2,883
	Percent	18.5	32.3	21.9
Woods	Acres	11,672	10,574	8,574
	Percent	69.6	62.2	65.1
Flood Damages	Dollars	108,777	123,048	76,748
	Dollars per acre	6.49	7.24	5.83

Source: Soil Conservation Service.

Table 5.16. Alternative flood reduction plans, costs, and benefits for selected upstream watersheds, Pearl River Basin, Mississippi

Item	Unit	Watershed name and number		
		03180001-010 Nanawaya Creek	03180001-070 Kentawka Creek	03180001-270 Tibby Creek
Alternative Number 2				
Structural Measures				
Floodwater retarding structure	Number	5	7	6
Control of watershed area	Percent	44.1	42.9	34.2
Total installation cost	Dollars	3,897,000	6,244,000	3,636,000
Area directly benefited	Acres	9,407	10,148	7,567
Benefits and Costs				
Average annual costs	Dollars	318,000	516,000	300,000
Average annual benefits	Dollars	75,710	131,999	78,231
Benefit-cost ratio	Number	.24 to 1.0	.26 to 1.0	.26 to 1.0
Alternative Number 3				
Structural Measures				
Floodwater retarding structure	Number	6	6	4
Control of watershed area	Percent	35.4	28.1	32.2
Total installation cost	Dollars	4,056,000	4,567,000	3,148,000
Area directly beenfited	Acres	11,114	11,892	4,990
Benefits and Costs				
Average annual costs	Dollars	333,000	379,000	259,000
Average annual benefits	Dollars	88,370	105,087	70,932
Benefit-cost ratio	Number	.27 to 1.0	.28 to 1.0	.27 to 1.0
Alternative Number 4				
Structural Measures				
Floodwater retarding structure	Number	3	4	3
Control of watershed area	Percent	25.3	37.8	20.9
Total installation cost	Dollars	2,418,000	5,078,000	1,937,000
Area directly benefited	Acres	8,117	8,256	6,575
Benefits and Costs				
Average annual costs	Dollars	198,000	419,000	160,000
Average annual benefits	Dollars	70,396	72,186	49,775
Benefit-cost ratio	Number	.36 to 1.0	.17 to 1.0	.31 to 1.0

Source: Soil Conservation Service.

Principal Streams

As an alternative for reducing flood damages along the principal stream flood plain reaches, a potential system of intermediate size floodwater retarding structures was selected by the Soil Conservation Service. Preliminary designs and cost estimates were prepared for the structures. The U. S. Corps of Engineers performed the flood routing and determined the flood stage reductions and flood damage reductions. This report discusses the structures but the evaluation of the system is not included.

Sixteen sites were selected above the Ross Barnett Reservoir for preliminary designs and cost estimates. Fourteen of these were finally selected to evaluate the effects on flood damage reduction. These fourteen ranged in drainage area size from about 49 square miles to about 116 square miles, with the average being about 69 square miles. About 32 percent of the drainage area above the Ross Barnett Reservoir is controlled by the structures.

Other sites were located below Jackson but were not evaluated. Generally, sites within this size range are available throughout the basin. All of the sites are tentative. The right-of-way problems that may be encountered were not studied in any detail. Map reviews and limited reconnaissance field reviews were made. The relocation or abandonment of roads are believed to be the major man-made problems.

The fourteen sites offered significant flood reductions in the vicinity of Jackson, Mississippi. However, costs exceeded flood damage reduction benefits. These potential sites are further discussed in the Appendix.

Forestry Needs

Management Systems

More than a quarter million acres of commercial forest land in the Pearl River Basin have been harvested over a period of years and not reforested. (See Table 5.17) This growing accumulation of unstocked potentially productive forest land is removing a growth base needed to meet the projected demand for softwood sawtimber. As nonindustrial landowners continue to remove timber without reforestation, the chances for a growth-cut imbalance increase. Landowners need help in planning for reforestation or regeneration.

To meet the projected demand for softwood sawtimber, areas will be reforested by planting, direct seeding, and natural regeneration. Planting stock has traditionally provided the major component of the reforestation effort. The expanded use of genetically improved stock is an important part of increasing the total supply of southern softwoods in the years ahead.

To increase forest productivity in the basin, the Mississippi Forestry Association (MFA) Forest Productivity Committee reviewed opportunities to prescribe silvicultural treatments. Out of the 3,025.0 thousand acres of forest land, 58 percent or 1,749.8 thousand acres offer viable opportunities for increased growth on private nonindustrial ownership. See Table 5.17 which classifies acres by county and treatment.

Table 5.17. Area of private nonindustrial forest land in need of silvicultural treatment, Pearl River Basin, 1981

County	Stand regeneration	Stand improvement	Regeneration after harvest	Conversion	Totals
	Thousand acres				
Attala	2.8	11.3	28.1	30.9	73.1
Choctaw	3.6	5.5	12.7	12.7	34.5
Copiah	1.8	10.7	37.4	14.2	64.1
Hancock	4.2	7.3	2.1	0	13.6
Hinds	3.8	2.5	8.8	10.1	25.2
Jefferson Davis	11.5	7.7	7.7	19.2	46.1
Kemper	1.0	3.2	7.9	3.2	15.3
Lamar	8.2	10.3	10.3	16.5	45.3
Lawrence	17.1	28.5	62.7	17.1	125.4
Leake	15.0	35.1	20.1	60.2	130.4
Lincoln	14.1	23.5	47.0	51.7	136.3
Madison	1.3	8.0	2.7	6.7	18.7
Marion	32.2	5.3	16.1	37.5	91.1
Neshoba	13.3	13.3	57.5	48.7	132.8
Newton	5.2	5.2	16.9	10.4	37.7
Pearl River	22.9	26.7	34.4	7.6	91.6
Pike	3.7	7.5	30.0	18.8	60.0
Rankin	24.8	12.4	124.0	68.2	229.4
Scott	14.7	14.7	49.0	29.4	107.8
Simpson	11.1	11.1	61.0	11.1	94.3
Smith	3.6	0	9.9	9.0	22.5
Walthall	6.8	0	27.2	40.8	74.8
Winston	10.9	29.0	25.4	14.5	79.8
TOTALS	233.6	278.8	698.9	538.5	1,749.8

Source: USDA, Forest Service, Southern Forest Experiment Station. 1977 Forest Survey of Mississippi.

The four major categories of silvicultural treatment recommended are:

Stand Regeneration - Site preparation and regeneration of poorly stocked pine and oak-pine stands to pine by planting or natural seeding, will result in better utilization of these sites. Thirteen percent of the acres or 233.6 thousand acres is in this category.

Stand Improvement - Treating adequately stocked young pine and oak-pine stands, to release the more vigorous and valuable trees from undesirable competition for growing space, will improve the quality and yield from these sites. This represents 16 percent of the identified acres, or 278.8 thousand acres.

Regeneration After Harvest - Site preparation and regeneration of mature pine and oak-pine stands to pine by planting or natural seeding immediately following harvest will substantially improve the quality and conditions of the new stands, resulting in increased yields. This treatment is dependent on the rate of harvest. It is the largest opportunity, accounting for 40 percent of the total, or 698.9 thousand acres.

Conversion - The conversion to pine of oak-hickory stand currently growing on pine sites as a result of mismanagement in the past will substantially improve the ultimate yield of these sites. A portion of these will generate revenue when harvested, while others will generate no revenue when cleared, due to a lack of markets for the low quality hardwoods presently on these sites. To the extent increased use of wood for energy increases, markets may emerge for the low quality trees these stands contain. Conversion represents 31 percent of the identified acres, or 538.5 thousand acres.

APPENDIX A

Upstream Watersheds

General

Twenty-eight of the upstream watersheds of the Pearl River Basin were identified as feasible projects, using PL-566 criteria, during the basin study completed in 1971. Several of these were reevaluated during the present study to determine the potential for feasible projects. Most of the watershed boundaries were about identical with boundaries of the 1971 study. However, a few boundaries were changed to fit the latest watershed delineations set up for the State.

Nineteen watersheds were reevaluated. Three of these were studied in some detail, with the results discussed in Chapter V of this report. The remaining sixteen are discussed briefly in this appendix. Additional details are available in an interim report prepared for the sixteen watersheds.

The sixteen watersheds are identified in Table A.1 by name and number. The sizes of the watersheds are also recorded in acres. Refer to Map 5.1 for the location of the watersheds.

Major Land Use

The major land uses for the selected watersheds vary. Forest use accounts for from 54 percent of the watershed area for Sipsey Creek Watershed to a high of 86 percent for Edinburg Watershed. Agricultural use ranges from a low of 12 percent in the Edinburg Watershed to a high of 40 percent in the Sipsey Creek Watershed. Urban and built-up and other uses are the other major land uses.

The acres of each major land use for each watershed are shown in Table A.2. Refer to the table for more details.

Transportation

The number and kinds of roads and improvements in a watershed indicates the development of any area. These data, including roads, railroads, and major pipelines, were estimated for the sixteen watersheds. Also, the number of road-stream crossings was estimated. These data are listed in Table A.3 for each of the sixteen watersheds.

Flood Damages

Table A.4 lists estimates on the number of floods, areas subject to flooding, flood plain land use, and average annual flood damages for each of

Table A.1. List of selected watersheds with their names, numbers, and drainage areas, Pearl River Basin, Mississippi

Watershed		Drainage area
Name	Number	Acres
Bogue Chitto Creek	03180001-020	82,723
Noxapater Creek	03180001-040	61,100
Sandtown	03180001-050	25,700
Pinishook Creek	03180001-060	53,193
Edinburg	03180001-080	32,805
Conehatta Creek 1/	03180001-180	84,330
Conehatta Creek (North)	03180001-181	34,906
Bogue Faliah Creek	03180001-190	27,677
Sipsey Creek	03180001-200	55,417
Hontokalo Creek	03180001-210	41,331
Tallabogue Creek	03180001-230	34,411
Shockaloo Creek	03180001-240	40,775
Yockanookany River	03180001-280	198,067
Coffee Bogue Creek	03180002-010	71,171
Fannegusha Creek	03180002-030	82,662
Pelahatchie Creek	03180002-050	136,410

1/ Includes 34,906 acres of Conehatta Creek (North).

Table A.2. Major land use by selected watersheds, Pearl River Basin, Mississippi, present, 1976

Watershed name and number	Major land use				Total
	Agricultural	Forest	Urban and built-up	Other	
	Acres				
Bogue Chitto Creek, 03180001-020	27,925	50,165	3,768	865	82,723
Noxapater Creek, 03180001-040	21,870	36,142	2,471	617	61,100
Sandtown, 03180001-050	8,897	15,445	1,111	247	25,700
Pinishook Creek, 03180001-060	12,665	38,675	1,667	186	53,193
Edinburg, 03180001-080	3,954	28,295	494	62	32,805
Conehatta Creek, 03180001-180	29,346	49,732	3,892	1,360	84,330
Conehatta Creek, North, 03180001-181	10,379	23,168	988	371	34,906
Bogue Faliah Creek, 03180001-190	4,880	21,808	371	618	27,677
Sipsey Creek, 03180001-200	21,932	29,716	2,842	927	55,417
Hontokalo Creek, 03180001-210	14,518	22,426	3,645	742	41,331
Tallabogue Creek, 03180001-230	13,468	18,657	1,915	371	34,411
Shockaloo Creek, 03180001-240	14,456	25,577	371	371	40,775
Yockanookany River, 03180001-280	49,610	136,781	9,946	1,730	198,067
Coffee Bogue Creek, 03180002-010	15,013	54,490	989	679	71,171
Fannegusha Creek, 03180002-030	22,735	45,285	1,668	12,974	82,662
Pelahatchie Creek, 03180002-050	32,682	89,457	8,465	5,806	136,410

Source: Soil Conservation Service.

1/ Conehatta Creek, North, 03180001-181, is a portion of Conehatta Creek, 03180001-180.

Table A.3. Transportation data, selected watersheds, Pearl River Basin, Mississippi, 1982

Watershed name and number	Roads				Major highways that cross the watershed	Railroads	Major pipe lines
	Paved	Gravel and other	Total	Stream crossings			
	Miles	Miles	Miles	Number	Highway Number	Miles	Miles
Bogue Chitto Creek, 03180001-020	79	95	174	139	16, 21, 397	0	0
Noxapater Creek, 03180001-040	55	80	135	108	15, 490	11	2
Sandtown, 03180001-050	13	48	61	45	15, 16, 21	0.1	0
Pinishook Creek, 03180001-060	36	71	107	84	19, 25	0	0
Edinburg, 03180001-080	22	54	76	45	16, 19	0	0
Conehatta Creek, 03180001-180	72	76	148	126	I-20, 80	0	5
Conehatta Creek, North 1/ 03180001-181	40	48	88	63	492	0	0
Bogue Faliah Creek, 03180001-190	6	34	40	37	21, 492	0	0
Sipsey Creek, 03180001-200	37	89	126	139	21, 492	15	0
Hontokalo Creek, 03180001-210	41	45	86	80	21, 35, 80, I-20	7	6
Tallabogue Creek, 03180001-230	36	22	58	58	35, 80	3	4
Shockaloo Creek, 03180001-240	23	47	70	52	35	1	3
Yockanookany River, 03180001-280	346	196	542	478	12, 14, 16, 35, 43	19	28
Coffee Bogue Creek, 03180002-010	16	111	127	61	13	0	3
Fannegusha Creek, 03180002-030	18	146	164	82	43, 471	0	5
Pelahatchie Creek, 03180002-050	37	112	149	207	13, I-20, 25, 43, 80	11	25

Source: Soil Conservation Service.

1/ Conehatta Creek, North, is a portion of Conehatta Creek Watershed, 03180001-180.

Table A.4. Area subject to flooding, land use in flood plain, and flood damages by selected watersheds, Pearl River Basin, Mississippi, present, 1981

Watershed name and number	Average annual floods	Area subject to flooding	Flood plain land use		Average annual flood damages to crop and pasture	
			Open	Woods	Total	Per acre of total flood plain
	Number	Acres	Percent	Percent	Dollars	Dollars
Bogue Chitto Creek, 03180001-020	2-6	19,602	27	73	123,738	6.31
Noxapater Creek, 03180001-040	1-4	8,561	27	73	31,795	3.71
Sandtown, 03180001-050	1-3	2,353	41	59	16,479	7.00
Pinishook Creek, 03180001-060	2-4	9,125	28	72	62,810	6.88
Edinburg, 03180001-080	1-4	2,308	36	64	14,289	6.19
Conehatta Creek, 03180001-180	2-6	16,213	23	77	127,550	7.87
Conehatta Creek, North, 03180001-181	2-6	6,309	26	74	58,324	9.24
Bogue Faliah Creek, 03180001-190	3-6	9,376	21	79	59,331	6.33
Sipsey Creek, 03180001-200	2-6	10,003	43	57	100,492	10.05
Hontokalo Creek, 03180001-210	3-6	8,682	32	68	111,149	12.80
Tallabogue Creek, 03180001-230	2-5	6,216	33	67	59,114	9.51
Shockaloo Creek, 03180001-240	4-6	8,155	26	74	72,707	8.92
Yockanookany River, 03180001-280	2-5	41,687	25	75	235,282	5.64
Coffee Bogue Creek, 03180002-010	3-6	7,447	21	79	46,837	6.29
Fannegusha Creek, 03180002-030	3-6	8,217	28	72	59,417	7.23
Pelahatchie Creek, 03180002-050	2-6	20,472	28	72	179,446	8.77

Source: Soil Conservation Service.

1/ Conehatta Creek, North, Watershed is a portion of Conehatta Creek Watershed, 03180001-180.

the watersheds. The average number of floods occurring annually range from a low of from one to four to a high of from four to six. Refer to the table for the average annual floods for each watershed.

The areas subject to flooding are shown in Table A.4 for each watershed. These estimates are defined by the 100-year storm. The flood plain for all watersheds exceeds 15 percent of the total watershed area, with several exceeding 20 percent, and one--Bogue Falia Creek--exceeding 30 percent.

The table lists for each of the watersheds the percent of open land and woods as a part of the total flood plain. Open land varies from 21 percent in Bogue Falia and Coffee Bogue Creeks Watershed to 43 percent in Sipsey Creek Watershed. These open areas are primarily made up of cropland and pasture.

Flood damages occur in each of the watersheds. The total average annual flood damages to crops and pasture are shown in Table A.4 for each watershed. The per acre damage to crops and pasture, based on total flood plain, varies from a low of about four dollars to a high of about thirteen dollars. See the table for damages for each watershed.

Status of Land Treatment

All of the sixteen watersheds contain open areas that are being used for crops and pasture. Resource management systems are needed on many of these acres. Table A.5 lists the acres of cropland and pasture that are adequately treated or protected and the acres that need treatment. The percent of the total is also shown. All but two of the watersheds have treatment needs on more than 80 percent of the cropland acres. This treatment need is 90 percent for six watersheds. Refer to Table A.5 for more details and for treatment needs on pasture acres.

Flood Damage Reduction Potential

A structural program to reduce flood damages was investigated for fifteen of the watersheds. The program consists of flood water retarding structures. The number of structures, average annual installation costs, operation and maintenance costs, and total average annual costs for each watershed are shown in Table A.6.

Table A.7 lists the average annual benefits for each of the watersheds along with the average annual costs. The benefit-cost ration for each watershed is also shown. All of these ratios are less than 1 to 1, with the highest being .29 to 1. Refer to the table for results for each watershed.

Conclusions and Recommendations

The results of the reevaluations of the selected watersheds studied do not compare closely with the 1971 Pearl River Basin study results. Some of the reasons are as follows: (1) criteria for watershed planning have changed, (2) construction costs and other installation costs have increased, (3) interest rates have increased, and (4) present criteria dictated that channel improvement not be considered.

Table A.5. Cropland and pasture resources by status of land treatment, selected watersheds, Pearl River Basin, Mississippi, present, 1975

Watershed name and number	Present area available	Part of total watershed	Status of land treatment									
			Cropland				Pasture					
			Adequate		Needed		Adequate		Needed			
	Acres	Percent	Acres	Percent [1]	Acres	Percent [1]	Acres	Percent [1]	Acres	Percent [1]		
Bogue Chitto Creek, 03180001-020	27,925	33.8	1,212	12.3	8,626	87.7	6,840	37.8	11,247	62.2		
Noxapater Creek, 03180001-040	21,870	35.8	1,331	15.2	7,417	84.8	5,612	42.8	7,510	57.2		
Sandtown, 03180001-050	8,835	34.4	233	7.0	3,088	93.0	1,724	31.3	3,790	68.7		
Pinishook Creek, 03180001-060	12,356	23.2	571	11.7	4,290	88.3	2,502	33.4	4,993	66.6		
Edinburg, 03180001-080	3,954	12.1	69	4.5	1,473	95.5	836	34.7	1,576	65.3		
Conehatta Creek, 03180001-180	28,666	34.0	1,561	14.4	9,275	85.6	5,453	30.6	12,377	69.4		
Conehatta Creek, North, 03180001-181 [2]	10,194	29.2	436	11.0	3,540	89.0	1,957	31.5	4,261	68.5		
Bogue Faliah Creek, 03180001-190	4,695	17.0	119	6.7	1,665	93.3	905	31.1	2,006	68.9		
Sipsey Creek, 03180001-200	21,932	39.6	411	6.1	6,298	93.9	4,436	29.1	10,787	70.9		
Hontokalo Creek, 03180001-210	14,333	34.7	461	8.7	4,842	91.3	2,730	30.2	6,300	69.8		
Tallabogue Creek, 03180001-230	13,036	37.9	478	9.9	4,362	90.1	2,440	29.8	5,756	70.2		
Shockaloo Creek, 03180001-240	14,271	35.0	666	12.6	4,633	87.4	2,939	32.8	6,033	67.2		
Yockanookany River, 03180001-280	49,424	25.0	3,005	14.7	17,395	85.3	9,920	34.2	19,104	65.8		
Coffee Bogue Creek, 03180002-010	14,951	21.0	972	19.7	3,962	80.3	3,833	38.3	6,184	61.7		
Fannegusha Creek, 03180002-030	22,550	27.3	2,351	25.4	6,894	74.6	6,708	50.4	6,597	49.6		
Pelahatchie Creek, 03180002-050	32,064	23.5	2,674	20.8	10,152	79.2	8,638	44.9	10,600	55.1		

Source: River Basin Survey Staff, Mississippi Data Base.

1/ As a part of the cropland total or the pasture total.
2/ Conehatta Creek, North (03180001-181), is a portion of Conehatta Creek Watershed (03180001-180).

Table A.6. Estimated average annual costs, floodwater retarding structures, by selected watersheds, Pearl River Basin, Mississippi

Watershed name and number	Floodwater retarding structures	Amortization of installation costs 1/	Operations and maintenance costs	Total average annual costs 1/
	Quantity	Dollars	Dollars	Dollars
Bogue Chitto Creek, 03180001-020	5	330,000	25,000	355,000
Noxapater Creek, 03180001-040	4	181,000	15,000	196,000
Sandtown, 03180001-050	2	93,000	7,000	100,000
Pinishook Creek, 03180001-060	3	194,000	15,000	209,000
Edinburg, 03180001-080	4	121,000	11,000	132,000
Conehatta Creek, 03180001-180	9	343,000	27,000	370,000
Conehatta Creek, North, 03180001-181 2/	5	226,000	17,000	243,000
Bogue Faliah Creek, 03180001-190	2	65,000	6,000	71,000
Sipsey Creek, 03180001-200	8	279,000	23,000	302,000
Hontokalo Creek, 03180001-210	5	246,000	19,000	265,000
Tallabogue Creek, 03180001-230	2	161,000	13,000	174,000
Shockaloo Creek, 03180001-240	4	229,000	18,000	247,000
Yockanookany River, 03180001-280	11	342,000	29,000	371,000
Coffee Bogue Creek, 03180002-010			N O N E	
Fannegusha Creek, 03180002-030	6	253,000	20,000	273,000
Pelahatchie Creek, 03180002-050	13	566,000	47,000	613,000

Source: Soil Conservation Service.

1/ Price base 1980, amortized at 7 7/8 percent interest for 100 years.
2/ Conehatta Creek, North, is a portion of Conehatta Creek Watershed, 03180001-180.

Table A.7. Comparison of benefits and costs for structural measures, selected watersheds, Pearl River Basin, Mississippi

Watershed name and number	Average annual benefits			Total benefits	1/ Average annual cost	Benefit cost ratio
	Flood prevention					
	Damage reduction	More intensive land use	Unemployed labor			
	Dollars	Dollars	Dollars	Dollars	Dollars	Ratio
Bogue Chitto Creek, 03180001-020	32,717	26,000	0	58,711	355,000	0.17:1
Noxapater Creek, 03180001-040	8,958	16,000	31,700	56,658	196,000	0.29:1
Sandtown, 03180001-050	3,838	5,000	0	8,838	100,000	0.09:1
Pinishook Creek, 03180001-060	24,949	22,000	10,400	57,349	209,000	0.27:1
Edinburg, 03180001-080	2,857	3,000	0	5,857	132,000	0.04:1
Conehatta Creek, 03180001-180	35,170	23,000	0	58,170	370,000	0.16:1
Conehatta Creek, North, 03180001-181	20,762	33,000	0	53,762	243,000	0.22:1
Bogue Faliah Creek, 03180001-190	7,262	0	0	7,262	71,000	0.10:1
Sipsey Creek, 03180001-200	27,390	25,000	0	52,390	302,000	0.17:1
Hontokalo Creek, 03180001-210	48,271	26,000	0	74,271	265,000	0.28:1
Tallabogue Creek, 03180001-230	18,089	11,000	0	29,089	174,000	0.17:1
Shockaloo Creek, 03180001-240	26,177	13,000	0	39,177	247,000	0.16:1
Yockanookany River, 03180001-280	47,870	34,000	1,200	83,070	371,000	0.22:1
Coffee Bogue Creek, 03180002-010	0	0	0	0	0	0
Fannegusha Creek, 03180002-030	12,583	16,000	0	28,583	273,000	0.10:1
Pelahatchie Creek, 03180002-050	50,452	46,000	0	96,452	613,000	0.16:1

Source: Soil Conservation Service.

1/ Price base: current normalized for crops and pasture; 1981 prices for all other (7 7/8 percent interest).

Overall, the evaluation results point out that a favorable benefit-cost ratio for these projects appears impossible under present conditions. Also, much of the open land being used for crops and pasture is not adequately protected.

Recommendations, based on the reevaluations results, are as follows:

1. Future planning in the overall watersheds to reduce flood damages is not recommended. Small parts of some of the watersheds may have a potential for planning to reduce flood damages.

2. The amount of open land and amount of cropland and pasture on erosion hazard soils, plus the low percent of these acres that are adequately protected, make these watersheds candidates for accelerated land treatment. Recommendations are that any immediate future planning in these watersheds be limited to improving the resource management systems on the open land classed as agricultural.

APPENDIX B

Intermediate Size Structures for Water Storage

General

As an alternative for reducing flood damages along the principal streams of the Pearl River Basin, a system of water storage sites were jointly investigated by the Soil Conservation Service and the U. S. Corps of Engineers. The storage sites were not limited to the PL-566 criteria. However, the sites are generally smaller than those investigated by the U. S. Corps of Engineers. The Soil Conservation Service located, designed, and made cost estimates for the sites. The U. S. Corps of Engineers did the hydrologic and economic evaluations along with the environmental impact.

Location and Size

A tentative selection for water storage sites was made throughout the Pearl River Basin. These sites were screened by using topographic maps (7 1/2' and 15' quandrangles). This screening eliminated all sites except those with drainage areas of from 40 to 120 square miles. Others were eliminated because of roads, pipelines, railroads, and houses. The final selection for further study was made and consisted of sixteen sites above Jackson, Mississippi, and several others below Jackson. Finally, only fourteen sites were selected for the hydrologic and economic evaluations. All were located above Jackson, Mississippi, as the primary concern for flood damage reduction was in the vicinity of Jackson.

The fourteen sites are listed on Table B.1. Drainage areas vary from about 49 square miles for Site 20 to about 116 square miles for Site 8. The approximate location of each site is shown on Map B.1. A total of 965 square miles, or about 32 percent of the drainage area above the Ross Barnett Reservoir Dam, are controlled by the fourteen sites.

Designs and Costs

A preliminary design was made for each of the fourteen sites, using stage-storage curves developed from the U. S. Geological Survey quadrangles. Design storms for class "c" criteria were routed through each site to determine the sizes of the principal and emergency spillways and other data necessary for cost estimates. Class "c" criteria are for high hazard dams. The principal spillway consists of an open riser for outflow from the reservoir through a pipe or a box conduit. The conduit flow is not controlled, and rate of outflow depends on the depth of floodwater storage in the reservoir.

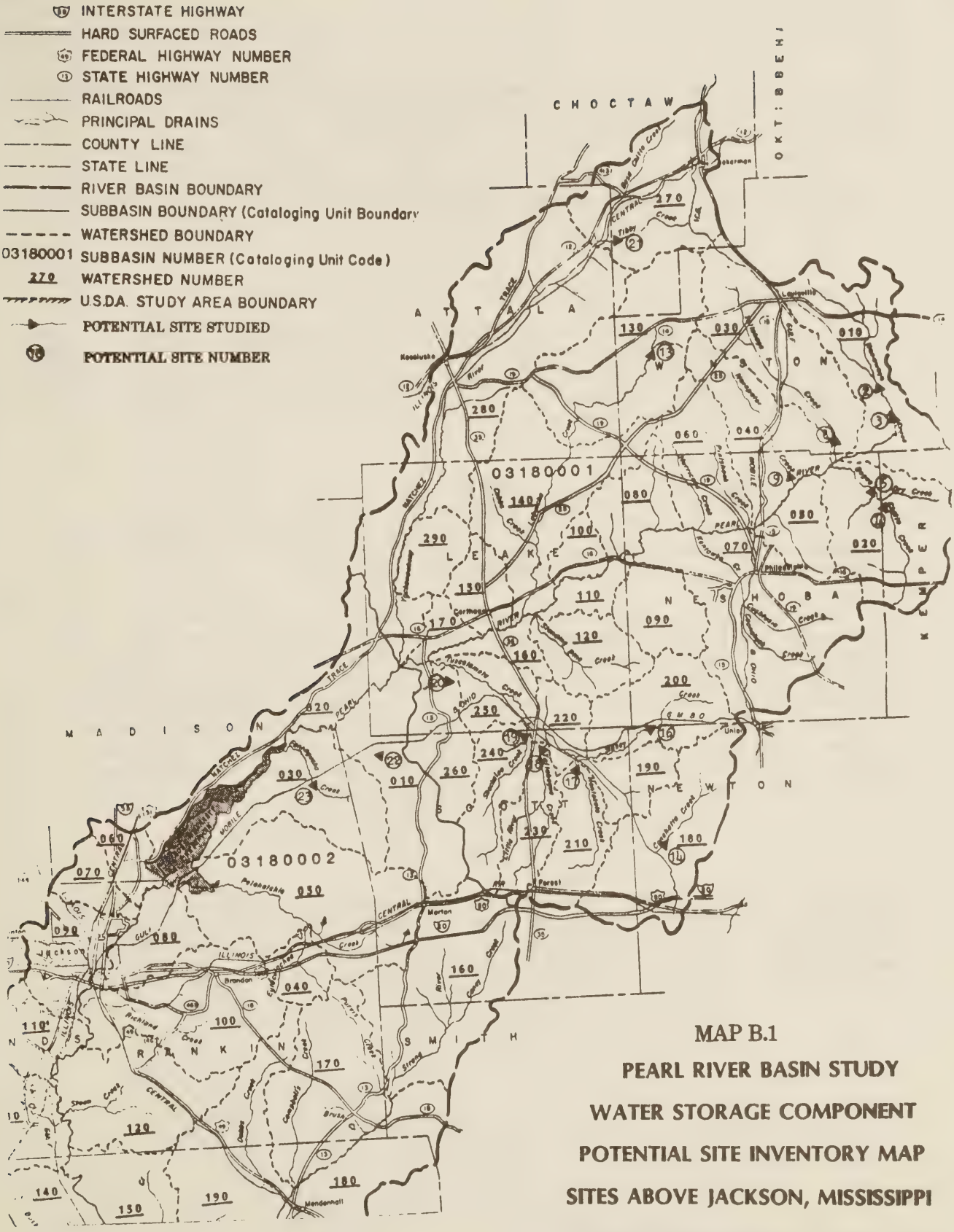
The fourteen study reservoirs provide floodwater storage totaling 387 thousand acre-feet. This is equivalent to about 7.5 inches of run-off from the controlled drainage area behind the dams.

Table B.1. Fourteen sites selected for investigation, with drainage area and total percent control

Site Number	Watershed Name	Watershed Number	Drainage area controlled Square miles
3	Nanawaya Creek	03180001-010	90.68
5	Bogue Chitto	03180001-020	108.97
8	Tallahaga Creek	03180001-030	115.97
9	Noxapater Creek	03180001-040	50.94
13	Upper Labutcha Creek	03180001-130	92.20
14	Conehatta Creek	03180001-180	51.61
16	Sipsey Creek	03180001-200	58.05
17	Hontokalo Creek	03180001-210	57.91
18	Tallabogue Creek	03180001-230	52.22
19	Shockaloo Creek	03180001-240	61.35
20	Bibalucta Creek	03180001-260	49.36
21	Tibby Creek	03180001-270	49.72
22	Coffee Bogue Creek	03180002-010	71.76
23	Tallahaga Creek	03180002-030	54.30
Total			965.04
Percent Controlled 1/			31.91

Source: Soil Conservation Service, United States Department of Agriculture.

1/ Total percent of watershed above the Ross Barnett Dam controlled by the 14 structures.



MAP B.1

PEARL RIVER BASIN STUDY

WATER STORAGE COMPONENT

POTENTIAL SITE INVENTORY MAP

SITES ABOVE JACKSON, MISSISSIPPI

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

June 19, 1981

Cost estimates were made for each study site and totalled for the fourteen sites. The total installation cost is about $72.8 million. Refer to Table B.2 for a breakdown of costs by sites and for the totals.

Total average annual cost for the fourteen sites above Jackson, Mississippi, is estimated at $5.7 million, including the $344.0 thousand for operation and maintenance.

Flood Stage and Damage Reduction

The evaluation of the water storage sites was accomplished by the U. S. Corps of Engineers. Generally, significant stage reductions resulted in the vicinity of Jackson, Mississippi. However, costs exceeded flood damage reduction benefits. This alternative for reducing flood damages will be discussed in the U. S. Corps of Engineers reports for the Pearl River Study.

Impacts

The proposed sites affect roads, houses, and other man-made resources. The relative impacts on these resources are shown in Table B.2 under "relocation payments." The higher the cost, the larger the problem.

Land resources are also impacted by construction of reservoir sites. The amount of land and general use of the land are shown in Table B.3. The U. S. Corps of Engineers will discuss the environmental impacts. Table B.3 lists for each site and for the total the acres of bottomland and upland affected by the reservoirs. The percent of open areas are shown along with the percent woods. Overall, about 45.7 thousand acres of land will be affected by the study sites, with about 34.9 thousand being bottomland acres and the remaining 10.8 thousand being upland. More than 90 percent of the bottomland is in woods. Refer to the Table B.3 for more details.

Other

This alternative for reducing flood damages in the vicinity of Jackson, Mississippi, is based on limited data. However, the results should provide information for making the determination of feasibility for the alternative and making a comparison with other alternatives.

Table B.2. Estimated costs for selected potential floodwater storage reservoirs, Pearl River Basin, Mississippi

Site	Installation costs					Total installation cost
	Construction	Engineering	Project administration	Land rights	Relocation payments	
Number	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
3	1,911,000	115,000	229,000	2,953,000	45,000	5,253,000
5	2,848,000	171,000	342,000	3,058,000	15,000	6,434,000
8	3,516,000	211,000	422,000	3,011,000	--	7,160,000
9	2,833,000	170,000	340,000	1,802,000	--	5,145,000
13	3,132,000	188,000	376,000	2,726,000	45,000	6,467,000
14	2,587,000	155,000	310,000	1,917,000	30,000	4,999,000
16	1,724,000	103,000	207,000	2,266,000	75,000	4,375,000
17	2,399,000	144,000	288,000	2,256,000	45,000	5,132,000
18	2,121,000	127,000	255,000	1,437,000	15,000	3,955,000
19	2,024,000	121,000	243,000	2,347,000	--	4,735,000
20	1,820,000	109,000	218,000	1,903,000	120,000	4,170,000
21	1,963,000	118,000	236,000	1,232,000	30,000	3,579,000
22	2,831,000	170,000	340,000	2,349,000	150,000	5,840,000
23	2,773,000	166,000	333,000	2,300,000	30,000	5,602,000
TOTAL	34,482,000	2,068,000	4,139,000	31,557,000	600,000	72,846,000

Source: River Basin Survey Staff, Soil Conservation Service.

Table B.3. Impacts on land and water resources of selected potential water storage sites, Pearl River Basin, Mississippi

Item	Unit	Site Number: Site 3	Site 5	Site 8	Site 9	Site 13	Site 14	Site 16	Site 17	Site 18	Site 19	Site 20	Site 21	Site 22	Site 23	TOTAL
Catalogue Unit Watershed	Number	03180001 010	03180001 020	03180001 030	03180001 040	03180001 130	03180001 180	03180001 200	03180001 210	03180001 230	03180001 240	03180001 260	03180001 270	03180002 010	03180002 030	
A. Normal Pool Area																
1. Bottomland	Acres	1,071	1,322	1,456	510	952	431	705	368	550	584	484	578	556	700	10,267
Open	Percent	2	1	0	3	1	0	15	0	1	35	0	35	1	0	6
Woods	Percent	98	99	100	97	99	100	85	100	99	65	100	65	99	100	94
2. Uplands	Acres	0	0	0	57	0	0	0	0	0	0	0	0	88	0	145
Open	Percent	0	0	0	30	0	0	0	0	0	0	0	0	31	0	30
Woods	Percent	0	0	0	70	0	0	0	0	0	0	0	0	69	0	70
3. Total	Acres	1,071	1,322	1,456	567	952	431	705	368	550	584	484	578	644	700	10,412
B. Flood Pool Area (excluding normal pool area)																
1. Bottomland	Acres	3,600	3,200	3,800	1,298	2,295	1,550	645	500	925	1,650	1,146	384	2,077	1,100	24,170
Open	Percent	3	0	1	10	20	10	70	0	15	4	0	19	5	10	8
Woods	Percent	97	100	99	90	80	90	30	100	85	96	100	81	95	90	92
2. Uplands	Acres	329	500	215	325	510	689	1,200	2,315	625	726	900	1,080	634	1,100	11,148
Open	Percent	10	40	2	30	60	10	50	10	35	17	28	48	21	5	25
Woods	Percent	90	60	98	70	40	90	50	90	65	83	72	52	79	95	75
3. Total	Acres	3,929	3,700	4,015	1,623	2,805	2,239	1,845	2,815	1,550	2,376	2,046	1,464	2,711	2,200	35,318
C. TOTALS																
1. Bottomland	Acres	4,671	4,522	5,256	1,808	3,247	1,981	1,350	868	1,475	2,234	1,630	962	2,633	1,800	34,437
Open	Percent	3	1	1	8	15	8	22	0	11	12	0	25	4	6	7
Woods	Percent	97	99	99	92	85	92	78	100	89	88	100	75	96	94	93
2. Uplands	Acres	329	500	215	382	510	689	1,200	2,315	625	726	900	1,080	722	1,100	11,293
Open	Percent	3	40	2	30	60	10	50	9	36	17	23	44	22	5	23
Woods	Percent	97	60	98	70	40	90	50	91	64	83	77	56	78	95	77
3. Total	Acres	5,000	5,022	5,471	2,190	3,757	2,670	2,550	3,183	2,100	2,960	2,530	2,042	3,355	2,900	45,730

Source: Soil Conservation Service, United States Department of Agriculture.